

Press release

Start of New Research Project GRE GEO

GEOTHERMICA launches Project “Glass Fiber Reinforced Epoxy Casing System for Geothermal Application (GRE GEO)”

Augsburg, 06.10.2020 Some of the main challenges in geothermal are corrosion and scaling. A multinational consortium of geothermal experts has launched a GEOTHERMICA project to develop a new glass fiber reinforced epoxy casing system for geothermal application, short GRE GEO. The casing system shall be used in new installations as well as utilized for workover for old wells. Furthermore, the project will include the guidelines and tools for the design, qualification, and installation of the GRE piping system.



Corrosion and scaling significantly reduce the lifespan of traditionally used steel casing systems, which must guarantee the wellbore integrity. Consequently, workover procedures are forced earlier than expected, and becoming a substantial financial burden. In contrast, Glass fiber casings (GRE) do provide a much-desired alternative as this material is corrosion resistant. However, in comparison with steel, GRE pipes are up to now only available in relatively small inner diameters, with excessively large outer diameters. The GRE-GEO (glass fiber reinforced epoxy casing for geothermal application) project will develop a new well completion strategy that aims to establish a corrosion-resistant alternative to decrease the development and production costs of geothermal energy while avoiding extra investments.

The consortium consists of eight partners:

- gec-co Global Engineering & Consulting Company GmbH, Germany, main coordinator
- DrillTec GUT GmbH, Germany
- TU Clausthal (ITE), Germany
- Future Pipe Industries (FPI), The Netherlands, national leader
- Dynaflo Research Group DRG, The Netherlands
- Nuclear Research and Consultancy NRG, The Netherlands
- Eartha AG, Switzerland
- Service Industriels de Genève, Switzerland, cooperation partner

“The lack of a suitable alternatives to steel jeopardizes the profitability of any geothermal projects, which are facing massive corrosion problems”, says Markus Ruff, Chief Engineer and Project Manager GRE GEO at gec-co. “Developing a glass fiber reinforced epoxy casing system will lead to a major improvement for new and existing geothermal appliances. Due to our extensive experience in deep drilling technology and geothermal systems, we have the necessary overview to analyze the various requirements and to coordinate this project successfully.”

Corrosion and the build-up of scaling is a major challenge in traditional casing systems, not the least because the scaling also contains traces of naturally occurring radiation (NORM). Application of glass fiber as pursued in this study will be a major step in tackling these issues. Dr. Govert de With, principal consultant at NRG, says that their experience with NORM and the computational technologies for scaling and corrosion modelling that they have developed over the last decades will be instrumental in assessing the strengths of this new innovation.

“Fiberglass has been used for more than 3 decades in the industry and the experience DRG has gained with the design and installation of composite materials translates well to the application of Fiberglass systems for geothermal wells” says Leo de Mul, Project Engineer for this project at Dynaflo Research Group (DRG). “The technical development of a new system needs to be accompanied by the development of guidelines and standards for the implementation of a new system and is key to get it accepted by the industry. With our long track record in Fiberglass design & applications and our active involvement in ISO, DNV and NEN committees we strongly believe we have the knowledge to make this project a success”.

“Future Pipe Industries is a leader in designing, manufacturing and installing engineered composite pipe solutions for the Oil & Gas, Chemical & Industrial, Water & Infrastructure, Marine & Offshore industries. Enhancing our extensive product portfolio, we offer comprehensive solutions including system design and engineering services, project management, technical support, field supervision and training. In addition to above, we strive to enhance our dedicated knowhow and products for geothermal use”, says Hermen Veltkamp, Sales Manager at FPI.

About gec-co Global Engineering & Consulting - Company GmbH (gec-co GmbH):

The Augsburg-based engineering company gec-co Global Engineering & Consulting - Company GmbH, founded in 2007, develops economically optimal concepts for electricity and heating systems in the field of deep geothermal energy from extensive geological and hydrological figures and data. More than 20 experienced employees from numerous disciplines from mechanical engineering to energy, environmental and process engineering accompany investors, municipalities and building owners through the entire approval, construction and operating phase from the first soil exploration to taking over the operational management. Communication and consulting services round off gec-co's field of activity.

The team members work worldwide as project managers for drilling, research and power plant projects, and as consultants and design engineer.

About Clausthal University of Technology (TUC):

The Institute of Subsurface Energy Systems (ITE) at Clausthal University of Technology, Germany, was founded in 1943. Its Drilling and Production department has its focus on drilling technology, well integrity and production optimization. The institute has intensified its research and development efforts in the area of geothermal energy in the past decade. A number of projects are conducted addressing essential challenges in drilling geothermal wells as well as during the production phase aiming to reduce investment and operating cost for geothermal energy.

ITE disposes of several laboratories covering all major research fields in subsurface energy systems. One of the department's most distinguished and unique facilities is the certified OCTG (oil country tubular goods) testing center, in which full scale pipes are exposed to all relevant types of loads according to API and ISO standards, resembling real operating conditions. Simultaneously, the outstanding expertise and technical equipment allows for fundamental research and development of new pipe materials, connections and full scale equipment. In regard to the current project, new testing techniques and procedures will be developed oriented towards glass fiber reinforced epoxy casing strings.

About Drilltec GUT GmbH

Based on experience of the execution of deep geothermal wells and the implementation of innovative technologies DrillTec has become a well-known partner of the E&P, Geothermal and other drilling related industry.

DrillTec's range of services includes:

- Drilling of wells for hydrocarbons, geothermal and gas storage wells
- Coordination and additional drilling services: e.g. pipe installation, casing drilling and supply of BHA components
- Complex workover and abandonment services
- Engineering services: planning, studies, local authorities procedures, personnel recruiting, drilling documentation including entire project management (EPC)

The operated drilling rigs are compact and modularly assembled and designed for high mobility and optimal transport. They are equipped with modern drilling software, enable a minimal visual interference because of low height, can be driven by generators as well as by power supply from grid and are suitable for cluster projects and geothermal wells because of their innovative skidding systems.

Their high level of automation and safety standard (SIL) and their field proven pipe-handling systems are essential parts of the rigs. Our rigs are manufactured in-house and enable a flexible reaction on market requirements including innovative solutions for new technical developments.

About Dynaflow Research Group (DRG)

Dynaflow Research Group (DRG) offers high quality engineering services ranging from the typical to the most complex and critical technical issues in the field of mechanics and flow. DRG has a thorough understanding of the physics behind the fluid flow phenomena and much experience with pipeline engineering. By combining its expertise in fluid flow behavior, dynamic oscillations, FEA and CFD analysis, DRG solves the most technically challenging problems for its clients. Since the earliest developments in pressurized fiberglass reinforced piping (FRP) took place in the middle east around the 1980's, DRG has had a strong presence in the design, analysis and third party review of FRP systems. DRG is consulted by a multitude of parties among which are pipe manufacturers, EPC contractors as well as operators. DRG is a leading technical member of the ISO 14692 committee since its installment and participates in other committees such as the DNV committee for certification of fiberglass craftsmanship and the ISO TC6 WG5 committee that is working to produce a standard that regards above ground non-tensile resistant FRP piping.

About Future Pipe Industries

Established in 1984 in Dubai, U.A.E., Future Pipe Industries has built a trusted reputation for delivering engineering excellence, and a commitment to creating value for our customers.

Today our operations are worldwide with manufacturing facilities and sales offices throughout the Middle East, Africa, Europe, North America and Asia. Advanced manufacturing, testing and process control systems drive 53 production lines spread over 681,000 m². We serve more than 400 customers and have installed over 190,000 kilometres of pipe worldwide. futurepipe.com

About NRG

The production of medical isotopes is the primary activity of the reactor in Petten, exploited by NRG. NRG is the global market leader in the supply of medical isotopes and also focuses on the development of new uses of medical isotopes for the purpose of treating life-threatening diseases. To this end, NRG collaborates with UMCs and pharmaceutical companies. NRG is an internationally active nuclear service provider; the organization performs nuclear technological research, provides consultation in the field of safety and reliability of nuclear installations and provides services in the field of radiation protection. It does research for governments in order to further develop nuclear technology knowhow. NRG exploits the High Flux Reactor, that is the property of the European Union. Its nearly 700 employees dispose of high-quality knowhow and innovative qualities. The organization works by order of and together with health care partners, the energy sector, the industry, governments and science.

Press:

Kim Schnurrenberger
gec-co GmbH
Bürgermeister-Wegele-Straße 6
86167 Augsburg

Phone: +49 821 / 56 993 00-27
E-Mail: presse@gec-co.de
Internet: www.gec-co.de