



Demonstration of soft stimulation treatments
of geothermal reservoirs

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Régis Hehn is involved in both geosciences and power plant operation aspects for the company. He participated in several wellbore operations such as drilling, logging, testing and hydraulic or chemical stimulations. He has been involved on several EU research projects and was the main contact point from ESG for supporting the GFZ in the tendering process, designing, planning and supervising the site operations such as logging and the stimulation itself.



Soft Chemical Stimulation of GPK-4 in Soultz-sous-Forêts (France)

Enhanced geothermal systems (EGS) measures are intended to improve the capacity of geothermal wells by increasing the transmissivity of the reservoir rocks and the connection between the formation and the wellbore. The DESTRESS project proposed the demonstration of a “soft stimulation” to enhance the reservoir performance in the naturally fractured granites of Soultz-sous-Forêts, France. The designed stimulation was based on a chemical treatment with a minimized environmental hazard of the well GPK-4, used as an injector for the electrical ORC Soultz plant in successful operation since 2016.

Prior to the operation, a complete well integrity and flow characterization have been realized. It gave important details about the casing and cement conditions, as well as useful information on flow zones. Based on those elements, a chemical stimulation has been designed. The acid, the injection protocol and the equipment needed were prepared and summarized in the tendering documents that allowed the selection of the more suitable service company. Prior to the operation, a comprehensive risk analysis has been realized. The technical risks associated with the potential interaction between stimulation and the power plant operations were considered and managed, as well as HSE risks for the reduction of the environmental footprint (Peterschmitt et al., 2018).

Finally, the soft chemical stimulation has been performed in late December 2019. The operations took about a week. Around 100 m³ of acid has been injected, without having to stop the powerplant operations and electricity production. The success was complete on the HSE point of view as no injury and no incident occurred, and no specific chemical and seismological impact has been detected. On the technical point of view, the monitoring during the following months the operation did not show any significant effect on the injectivity of GPK-4.

