GeoWell: Well integrity and risk assessment for high temperature geothermal wells – Lessons learnt

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The lifetime of production wells significantly influences the economic viability of electricity production projects tapping high temperature geothermal resources. The key economic success is therefore to maintain the integrity of wells and keep such wells operating for several decades, while minimizing down time. This is not an easy task due to the aggressive nature of geothermal fluids and high temperatures that adversely affect the conditions of well barrier elements such as casings and cement. Applying risk assessment and management practices using a well barrier approach is one of the means that can contribute achieving long-term operation of wells. This is similar to what has been practiced in the petroleum industry for many years. As part of activities performed in the Horizon 2020 GeoWell project, the risk assessment working group has first identified the generic risk assessment methods and practices that have been implement in the geothermal industry. This was carried out through performing a literature survey and an on-line questionnaire that was filled out by responders from both geothermal and petroleum industries. The group then tried to find similarities and differences between the geothermal and petroleum industries when it comes to risk practices and techniques. This was performed to gain knowledge of methods and techniques that have transferability potential between industries. Using a well barrier approach, which is a standard approach for maintaining well integrity in the petroleum industry, a risk assessment and management framework for high temperature geothermal wells have been outlined. The group has then provided a foundation for geothermal well integrity risk assessment to facilitate conformity in the way risk assessments should be performed. This presentation summarizes different stages of the work that resulted in establishing the foundation of well integrity and risk assessment/management practices for high temperature geothermal wells. The presentation also covers lessons learnt during implementation of the project in this context.