Gas Well Production Enhancement - KOGAS/SNL Collaboration

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Theme: Sandia and KOGAS are developing cooperation opportunities related to unconventional (from shale sources) gas resource recovery. There are currently three initiatives which represent seeds of a broader research initiative:

KETEP
KOGAS with SNL Support, prepared and submitted a proposal to Korea Institute of Energy Technology Evaluation and Planning (KETEP) Energy R&D funding agency under the Ministry of Trade, Industry and Energy (MOTIE) titled "Investigation of Petrophysical/Geomechanical Properties of Unconventional Resources using 3D Printing Techniques": This proposal would provide for a collaborative effort to:
1. Understand the structural and topological properties of pore and fractured systems
2. Replication of real rocks by digital and synthetic rocks at the highest level of quality and resolution of imaging and 3D printing
3. Upscaling pore-scale characteristics of the overall system response at the reservoir scale
4. Quantitative analysis of the effect of geological and engineered processes on the petrophysical/geomechanical properties.

DOE FE
SNL, in partnership with Purdue University (PI: Laura Pyrak-Nolte) submitted a proposal for the NETL (non-DOE lab leading proposal, DE-FOA-0001722 Topic Area 2: Advancement in Subsurface Diagnostics), entitled "Integrated Geomechanical and Geophysical Diagnostic Tool for Hydraulically-Induced Fractures". In this proposal:
- KOGAS provides SNL with field data measured in the Horn River Shale basin, British Columbia, CA. The field data includes detailed site characterizations including well-log data, geophysical monitoring, production/completion design, production data, and (micro-)seismic data. The data will be in raw/re-organized format and includes analysis results from their ongoing projects.
- SNL proposed to test and validate new diagonostic tools for hydraulically-induced fractures with the Horn River data.

SNL LDRD
SNL is investing through Laboratory Directed Research and Development (LDRD) to understand induced seismicity through a project titled, "Integrated Geomechanics and Geophysics in Induced Seismicity: Mechanisms and Monitoring" based on a previous investment called, "Digital Rock Physics". The on-going project will use the Horn River data to test integrated geomechanical and geophysical tools to understand and potentially predict induced seismicity.

KOGAS Funding
We are in discussion with KOGAS and multiple universities to jointly develop a joint US-Korean gas production research field with associated long-term improvements for total gas production.