

CEE 595F – Geotechnical Engineering Seminar

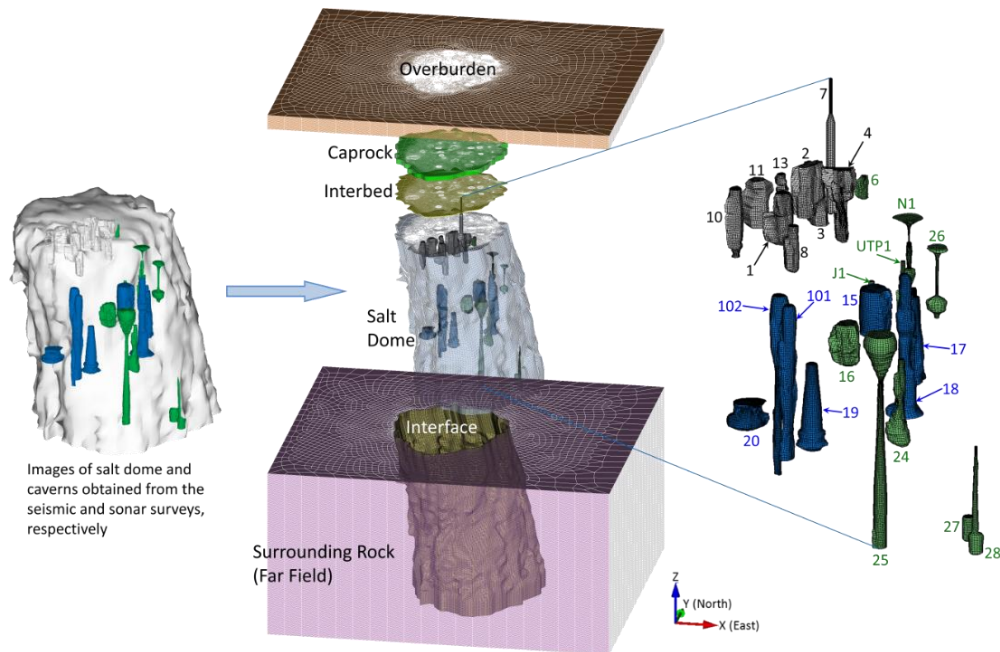
Friday, September 7, 2018 | 11:00 AM, Newmark Lab 3310

Geomechanical Simulations Using Multi-Mechanism Deformation Model of Salt

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The presentation will introduce simulations for the disposal repository for the radioactive waste and strategic petroleum reserve (SPR) which are constructed into the salt basin and dome, respectively. Therefore, the salt constitutive equations and the steps for the finite element modeling will be presented (see the figure below). Simulation results will illustrate the behavior of the disturbed rock zone (DRZ) around the disposal room, and the structural integrity of the edge pillar and cavern roof of SPR caverns. The presentation focuses on the practical side of research rather than academic, so it will be a good reference for how to apply the knowledge obtained from the university into the real civil world. This seminar will be helpful to people are interested in the structural analysis of the underground structures.

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The images of salt dome and caverns obtained from the seismic and sonar surveys, respectively (left) and overview of the hexahedral finite element meshes of the stratigraphy and cavern field at Bayou Choctaw. The U.S. Strategic Petroleum Reserve stores crude oil in the seven blue caverns. The other caverns are the Boardwalk caverns (green) and abandoned caverns (gray). The cavern ID numbers are also shown.



Dr. Byoung Yoon Park joined Sandia National Laboratories in March 2002. He is a principal member of technical staff in Geotechnology and Engineering Department. He has been working in nuclear energy and petroleum industry for 33 years. At Sandia, he is currently performing the structural evaluation of the strategic petroleum reserve and previously conducted WIPP performance assessment. From 1994 to 2002, he worked at KAERI as a principal researcher where he instigated the nuclear radioactive waste disposal research. He developed a 3D fracture network model and a 3D continuum model for analyzing the groundwater flow from a repository into the far field. From 1985 to 1993, he worked at KOPEC as a senior engineer. He performed the probabilistic safety assessment (PSA) for six Korean nuclear power plants (NPPs). He established a methodology of seismic fragility analysis for PSA of NPP. He is the author or coauthor of more than 100 peer-reviewed publications including four Science Citation Index journal papers. He won “Best Paper Award” for the 47th U.S. Rock Mechanics/Geomechanics Symposium in San Francisco in 2013. He earned B.S. in Nuclear Engineering in 1982, M.S. in Civil Engineering in 1985, and Ph.D. in Mineral & Petroleum Engineering in 2000 at Seoul National University.

WIPP: Waste Isolation Pilot Plant

KAERI: Korea Atomic Energy Research Institute

KOPEC: Korea Power Engineering Company (KEPCO E&C now)