Induced Seismicity Consortium (ISC)

The Induced Seismicity Consortium (ISC) addresses a very critical and under-developed aspect of potential risk for damaging man-made earthquakes associated with hydraulic fracturing operations, waste water injection, fluid production and disposal wells, enhanced geothermal resource development, and EOR/CO₂ sequestration. This collaborative effort integrate efforts of scientists from the Southern California Earthquake Center (SCEC), the Department of Civil and Environmental Engineering (CEE), and the Petroleum Engineering Program at the University of Southern California. Direct communications with the industry people, state geologists, national laboratories and governmental regulatory bodies as well as the environmental groups and the general public will ensure a science based approach for fact finding and informations dissemination.

The consortium will support two key integrated programs:

- Advancing geoscience and engineering technologies required to predict geologic and surface impacts of subsurface fluid injection (including hydraulic fracturing) and production processes (SFIP) and developing “Best Practices.”
- Effectively communicating, informing, and advising regulatory, educational, and public entities regarding SFIP operations and impacts.

**ISC Project Plan**

1. Characterizing Fracture Network using MEQ data
2. Establishing correlations between induced seismic events and microseismic attributes
3. Developing a hierarchical probabilistic model for understanding the relationship between operational parameters, subsurface stress and observed seismicity
4. Designing a system to mitigate the seismic hazards associated with SFIP
5. Providing a regional geologic framework for interpreting observed seismicity and predictive modeling
6. Creating a science-based framework for input to regulatory and government entities
7. Introducing educational and communication programs for the professional community and the general public

**ISC Management Structure**
Induced Seismicity Consortium (ISC)

Introduction to Induced Seismicity

fracture treatment / Fluid Injection / CCS

Increase in stress and pore Pressure

Decrease the stability of existing weak planes (natural fractures, bedding planes)

slip and fail, similar to earthquakes along faults

slippages emit elastic waves (stimulated seismicity)

Induced Seismicity Data Base

Models-IS Risk Maps

How to join ISC?

We invite your company or organization to join ISC and be among a pioneering group aiming to turn the collaborative work of ISC into a foundation for intelligent management of fluid injection/extraction and hydraulic fracturing programs. Ultimately, we expect to establish procedures to develop science-based risk maps and procedures to help minimize the potential for induced seismicity. For more details on the problem statement, the proposed program directions, membership in the consortium and USC team capabilities, please visit: http://gen.usc.edu/uscinduced-seismicity-consortium.) For additional information please contact Prof. Fred Aminzadeh: faminzad@usc.edu, 213-821-4268 or Dr. Don Paul: donaldpa@usc.edu, 213-821-8165.

Center for Geothermal Studies  cg.usc.edu  +1.213.740.8028  faminzad@usc.edu