



DanaEnergy



**Geophysical
Services**



DanaEnergy

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INTRODUCTION

Dana Energy is a fully private company, active in upstream oil and gas industry and is seeking excellence in providing services to NOCs and IOCs and providing seismic solutions to the client's needs from designing a survey to monitoring of reservoirs. Benefitting from well-experienced personnel and well trained graduates, modern and updated hardware and software equipments, and well defined management plan make Dana Energy a reliable company in upstream oil and gas industry especially seismic data acquisition, processing and interpretation services.



SERIVCES

Our Geophysical Services is able to provide below services to its clients with high international standards:

- **Seismic Data Acquisition, 2D/3D, including:**
 - Survey design and planning (2D/3D seismic and VSP)
 - Surveying
 - Seismic Drilling
 - Recording (Mountainous, land and TZ areas)
- **Seismic Data Processing, 2D/3D, including:**
 - Standard Processing
 - PSTM/PSDM
- **Seismic Data Interpretation, 2D/3D, including:**
 - Structural
 - Stratigraphic
 - Reservoir Characterization
 - Geohazards Study
- **Non-seismic Services, including:**
 - Non seismic operations such as gravity, magnetic and MT services (Data acquisition, processing and interpretation)
- **RGE**
 - Reservoir Geoscience and Engineering



DATA ACQUISITION

2D & 3D LAND, MOUNTAIN, TRANSITION ZONE & SHALLOW WATER

We offer specialized, cost effective 2D & 3D land, Mountain, Transition Zone and shallow water seismic data acquisition through the application of cutting-edge design, acquisition and on site processing techniques.

Utilizing versatile field equipment, all of our seismic crews have the ability to acquire efficient, accurate, reliable and cost-effective 2D and 3D single and multi-component seismic data regardless of terrain conditions.

For faster turnaround time and higher data quality, also offers a broad suite of in-field seismic data processing services, which are integrated with our processing center.

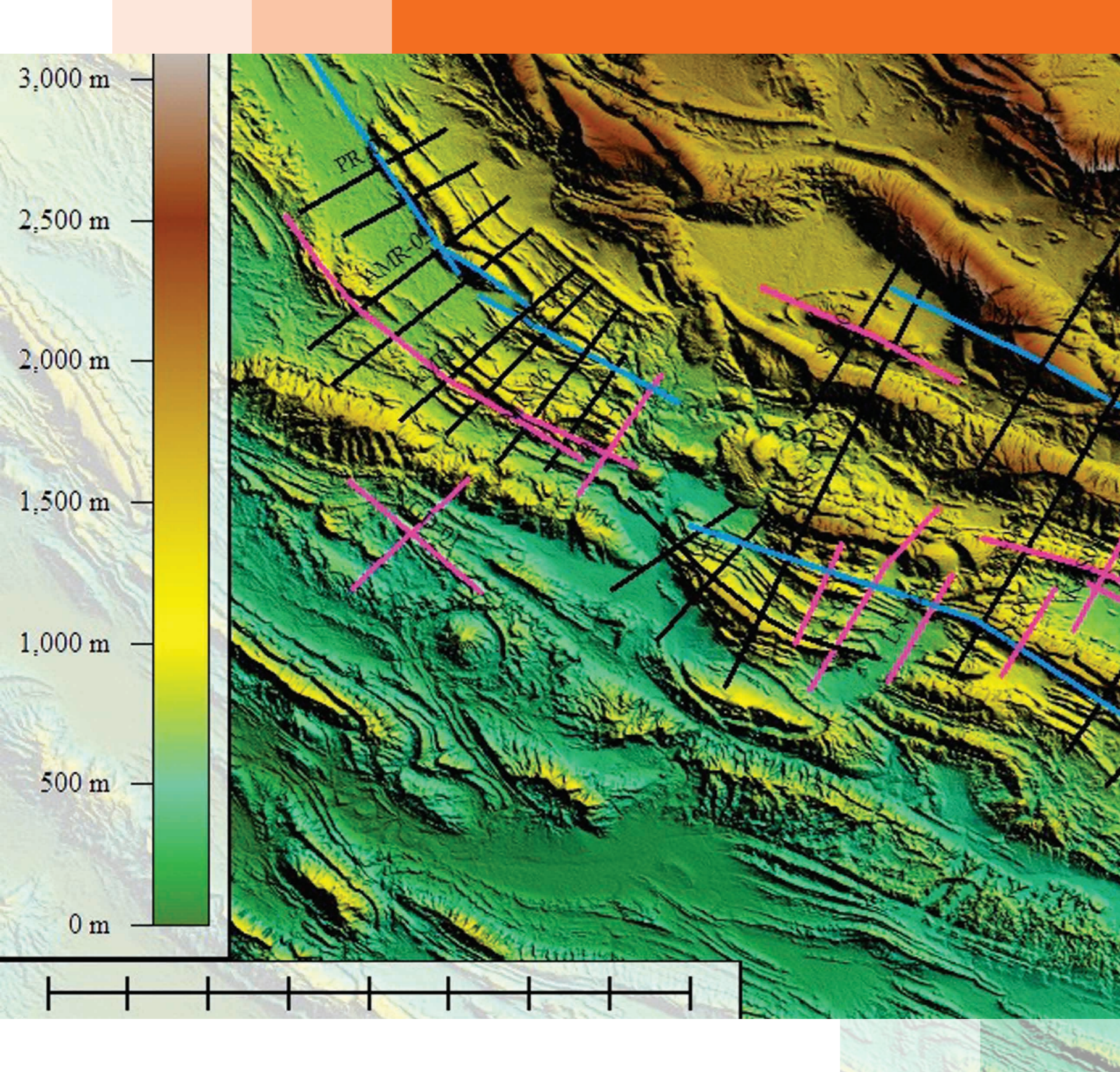
With our start-to-finish prospect-driven results, we can reduce exploration risk and cost, and help our clients meet their exploration objectives faster.

Our crews, driven by active use of the quality, Health, safety and environment management system always operate with the highest standard.

We believe that the reliable Project Management system is essentially required to correctly balance the time, cost and quality of a project along with the character, knowledge, attitude and ability of the personnel in charged. Strong Project Management using PMBOK and Project Planning and Control, enabling us to meet the client requirement at the reasonable time frame with the highest quality.



SURVEY DESIGN & PLANNING



Achieving to optimum results is in debt of efficient survey designing. An accurate survey design can lower costs and guarantees the final quality and accuracy of data. So before any shot, expert designers should determine appropriate parameter according to different field conditions and existing facilities in order to have better imaging of the targets.

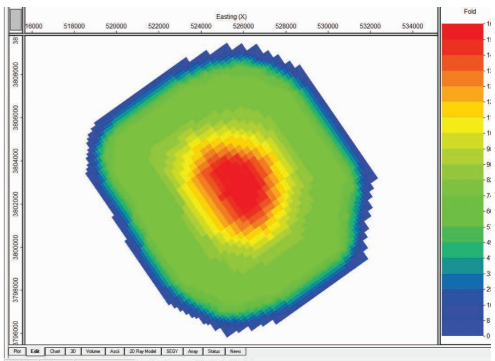
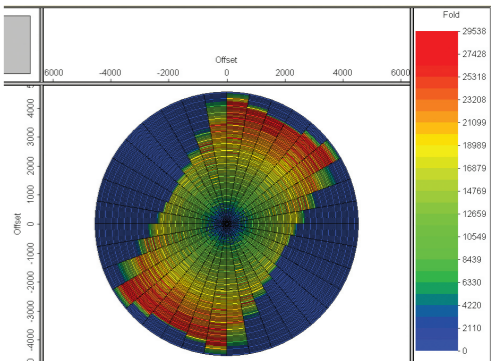
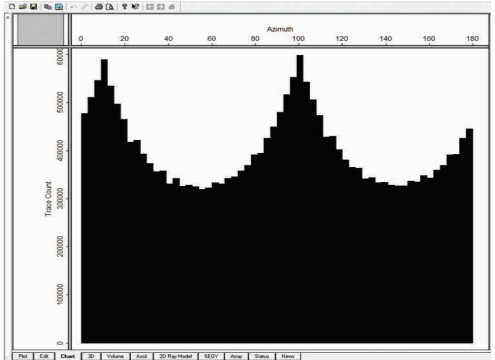
The knowledge of seismic processing and interpretation is always prior and essence of seismic survey design. Some of the services which are specialized with Dana Energy are listed below:

- 2D & 3D seismic survey design: (Land, Mountain, TZ, Marine)
- 3C & 4D survey design

- VSP survey design
- Optimum hardware and equipment selection according to facilities and targets

These are including:

- Azimuth and offset distribution
- Geometry determination (Swath, Orthogonal, Brick, Patch, Radial)
- Source application strategy (Dynamite or Vibrators)



SURVEYING/GIS

Our surveying/GIS management by having experienced surveyors and GIS experts, skilled technicians and operators, and using modern positioning systems is able to support a wide range of 2D/3D Project. We can execute different operations as below:

- Survey for 2D & 3D land, transition zone seismic project
- Establishing geodetic satellite networks for areas with lack control points transformation.
- Collecting and ordering of different available maps and satellite images of the project area and Creating GIS Geo-Database of the area with suitable data model structure
- Specifying geoid model for different operational locations
- Creating the appropriate workspace with all information of the project area in GIS environment for helpful interaction between the client and the contractor to meet the technical requirements and all Geo-Related information of the project
- Implementation of WEB-GIS for monitoring of operational progress map of the projects and accessibility from Intranet/Internet by Camp, main office and client with some application queries

LAND SURVEY EQUIPMENT AND SOFTWARE:

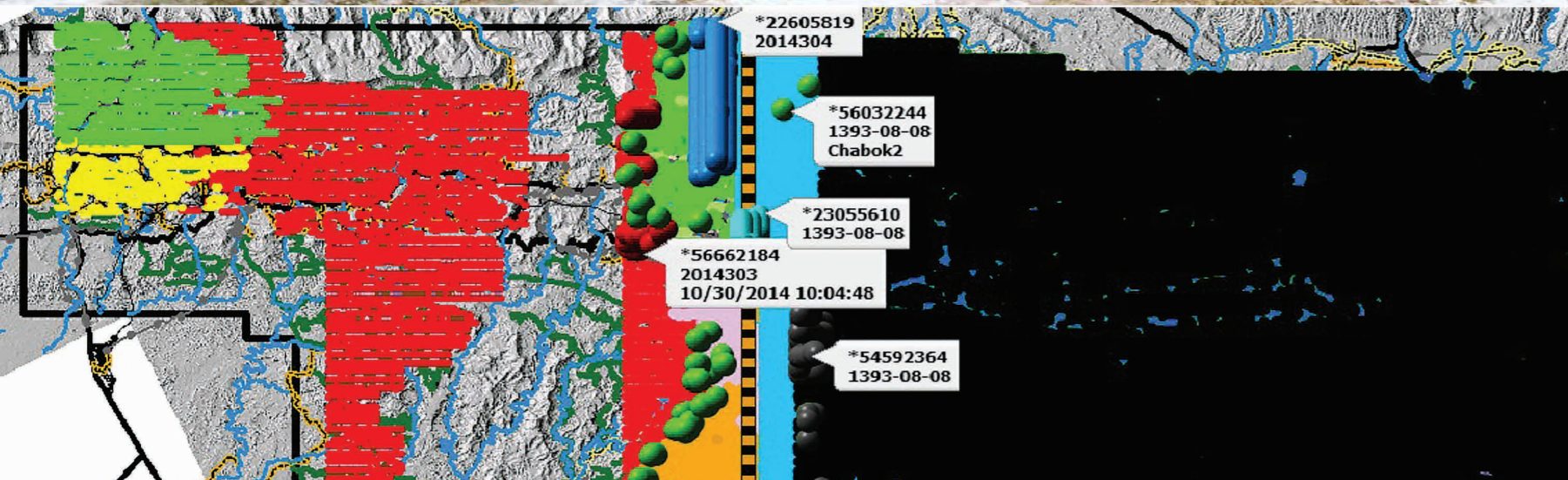
- Leica newest systems (Viva GPS/ Glonass series) DGPS satellite positioning equipment
- Leica Total station survey equipment

(T09 Model) with prisms and side necessities

- Garmin new hand-held receivers
- Various related software such as LGO, GPSeismic, Geocalc, Autocad and MicroStation
- ArcGIS Desktop and ArcGIS Server software

TRANSITION ZONE SURVEY EQUIPMENT AND SOFTWARE:

- StarFix-HP DGPS marine positioning system
- Echo Sounder, M35 Model
- Valemart CTDS (sound velocity meter tool)
- Vessel equipped with marine survey instruments
- WinFrog software
- Receiving correctional signals from different coastal stations such as Kuwait and Bahrain





DRILLING

Seismic Drilling is challenging step in any seismic acquisition project, and Dana Energy has fulfilled its necessity by combination of updated management, knowledge and technology. Experiencing all type of train projects from mountain to desert, jungle, swamp, marsh and transition Zone areas enabled us to be equipped with all kind of drilling rigs such as ground hug, portable, tractor mounted, air boat mounted, heavy and buggy drills and several compressors and pumps with different output power either air or water based.





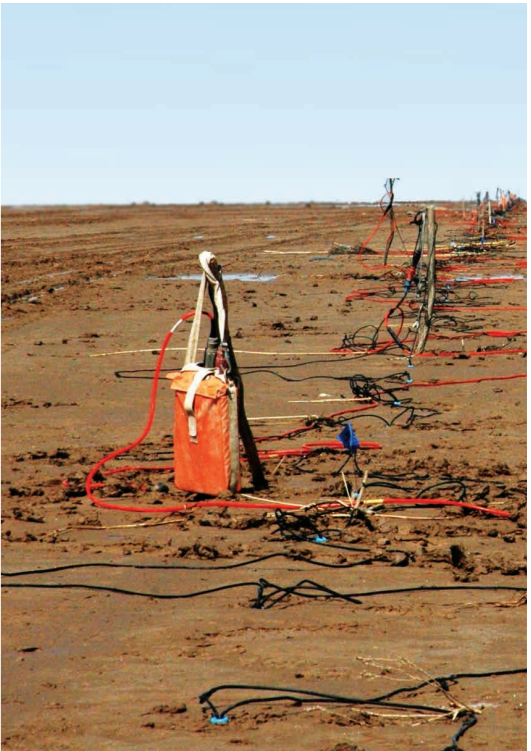
RECORDING

Dana Energy with the up to date software such as ProMax, Vista, OMNI and GMG, can monitor not only the day to day recorded data but can produce geometry files, static calculation, velocity analysis, stack and migration. Also on-site survey design will be done for necessary changes during survey.

This would enable data to be delivered with correct SPS files, QC description, static and velocity files which the processed data would be included. Data can then be sent to processing center for more processing steps which require extreme amount of machine power and disk space.

Based on clients' requirements we can offer:

- Sercel 428 recording instruments
- Nomad 65 Vibrators
- Various DGPS and conventional survey instruments
- Various Rotary Drill Units such as: Heliport able, Truck Mounted, portable and conventional drill
- Various sources, Dynamite, Vibrator and Air Gun





QUALITY CONTROL

Dana Energy with the up to date software such as ProMax, Vista, OMNI and GMG, can monitor not only the day to day recorded data but can produce geometry files, static calculation, velocity analysis, stack and migration. Also on-site survey design will be done for necessary changes during survey. This would enable data to be delivered with correct SPS files, QC description, static and velocity files which the processed data would be included. Data can then be sent to processing center for more processing steps which require extreme amount of machine power and disk space. Having the experience, and with the use of reliable softwares, we are ready to locate the following services in any acquisition projects.

FIELD PROCESSING:

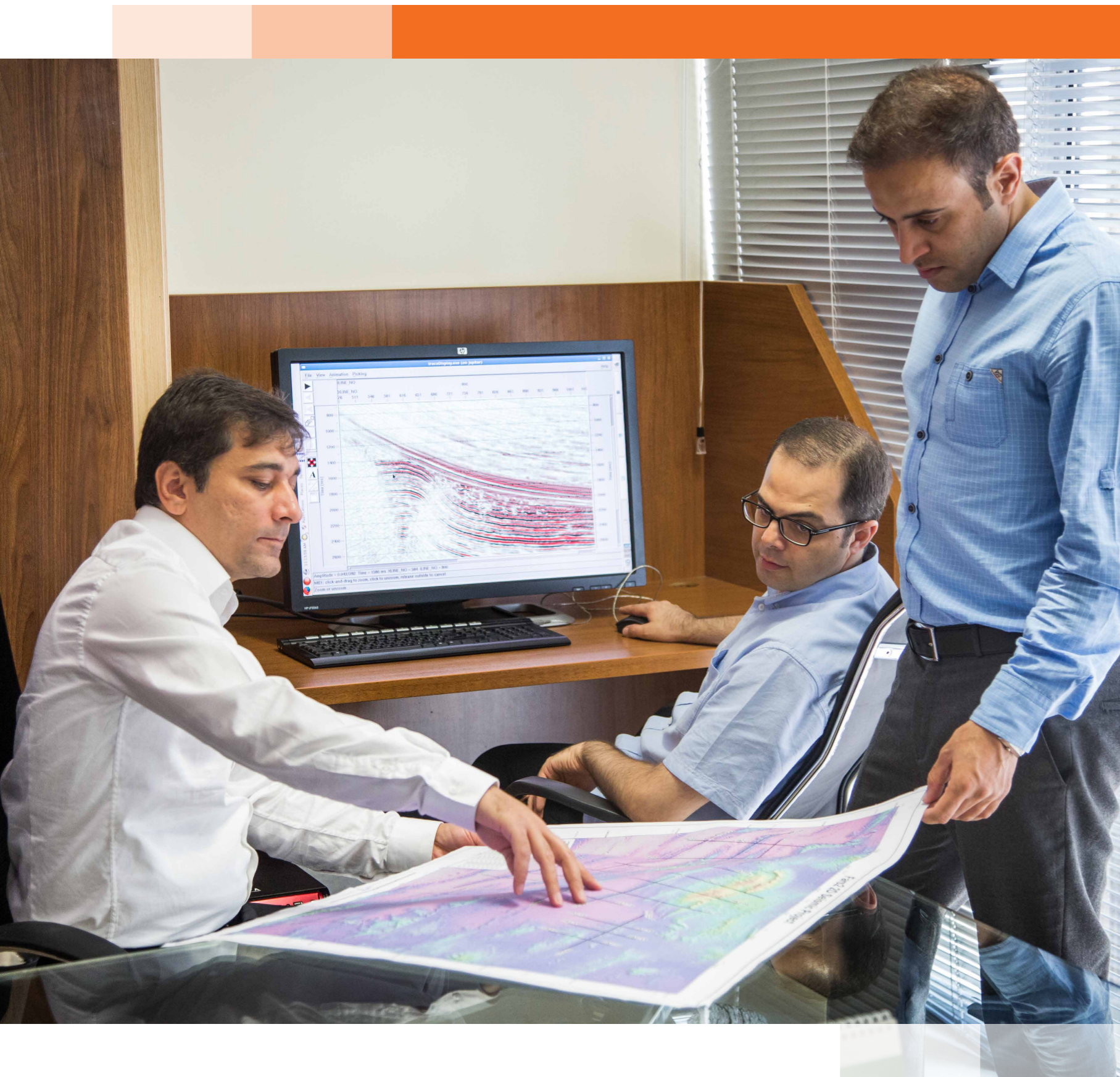
- Data reformat
- Navigation merge
- Trace edit
- Phase matching
- Elevation and refraction static correction
- Pre stack noise attenuation
- Deconvolution
- Velocity analysis

- Residual static correction
- DMO correction
- Stack
- Post stack migration

FIELD QC PROCEDURE:

- Controlling the production of operation crews
- Test analysis
- Fold analysis and on-site designing
- Checking the signal to noise ratio and quality of recorded data
- Noise analysis
- Geometry QC
- Near offset display and LMO analysis
- First break picking
- LVL, down-hole and up-hole operation and interpretation
- Low velocity layer modeling (velocity and depth)
- Field reports
- Near offset display and LMO analysis
- First break picking
- LVL, down-hole and up-hole operation and interpretation
- Low velocity layer modeling (velocity and depth)
- Field reports





SEISMIC DATA PROCESSING

Seismic data processing is a crucial bridge between acquisition and interpretation, so it needs both accuracy and speed. Having consummated and experienced employees and state of the art hardware and software facilities make Dana Energy fully capable of running a wide variety of processing routines.

PROCESSING METHODOLOGY

- Standard processing routines, 2D, 3D, pseudo 3D, land, marine, transition zone and OBC.
- Multi component data processing.
- Large offset/wide angle data processing.
- VSP processing.
- Velocity model building and pre stack depth migration.
- Anisotropic velocity analysis and migration.

ADVANCED PROCESSING TECHNIQUES

- Reprocessing of mixed-vintage data.
- Multiples suppression.
- Land processing with significant static problem.
- Amplitude preservation for attribute analysis.
- Low signal to noise ratio data processing.
- Tomographic statics correction.
- OVT PSTM and PSDM.
- Salt imaging.
- AVO processing.

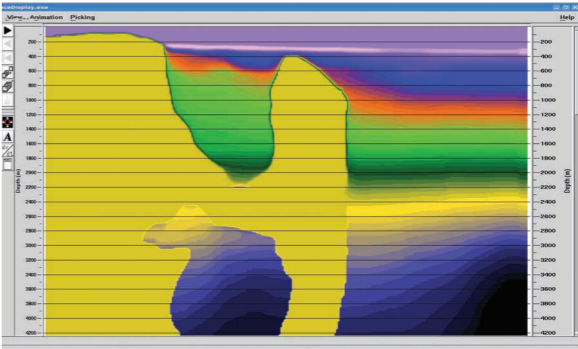
SOFTWARE FACILITIES

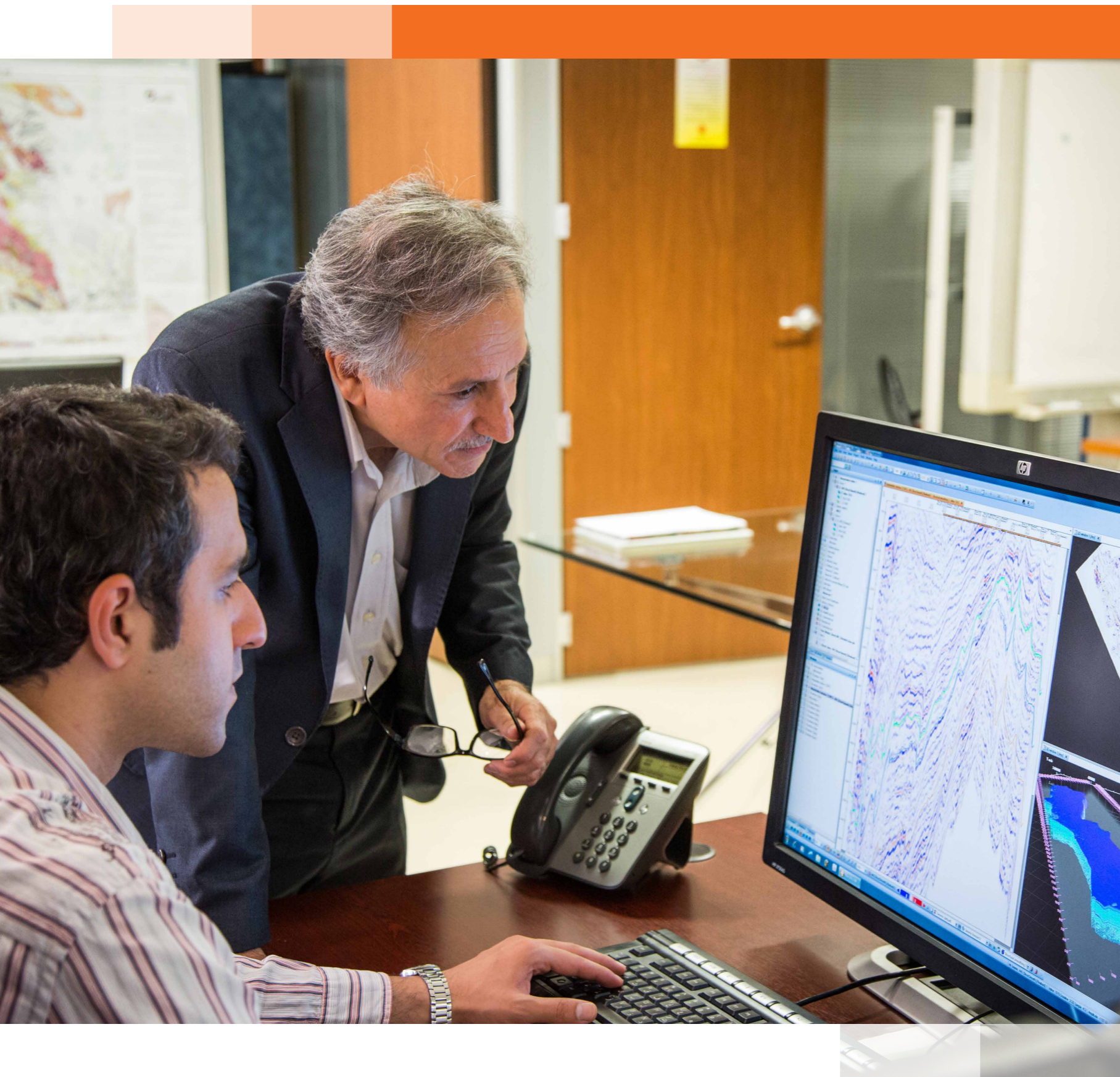
Dana Energy uses commercial and in-house software packages to provide processing services to the oil and gas industry

HARDWARE FACILITIES

High-end Linux pc-cluster capable to handle several simultaneous big projects.

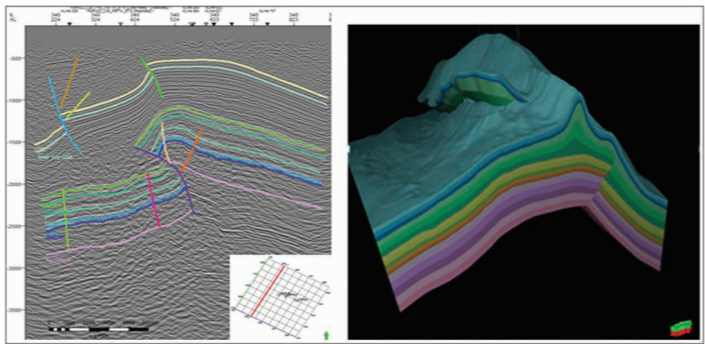
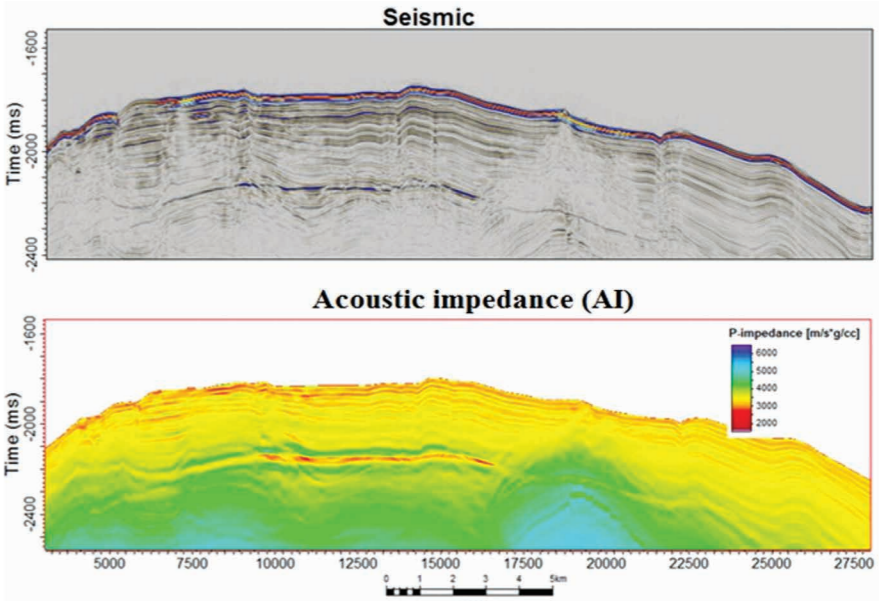
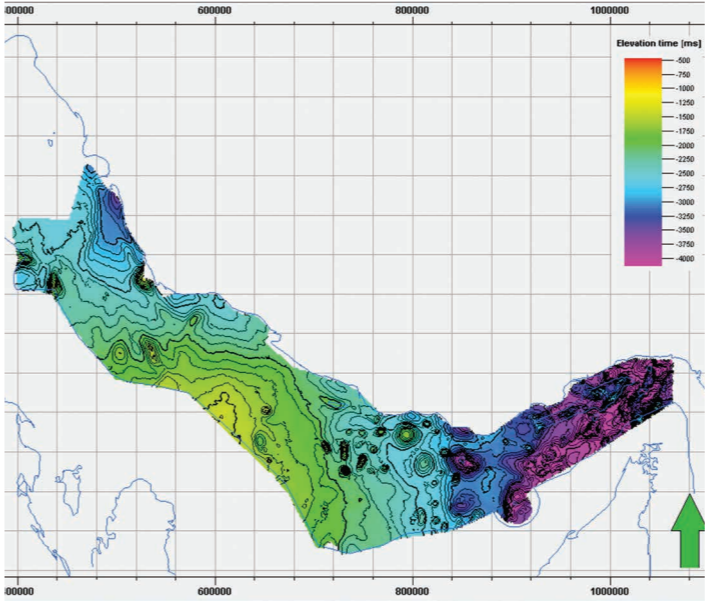
- PC Cluster 21 TFLOPS
- 400 TB Storage.
- 4.5 TB RAM





INTERPRETATION

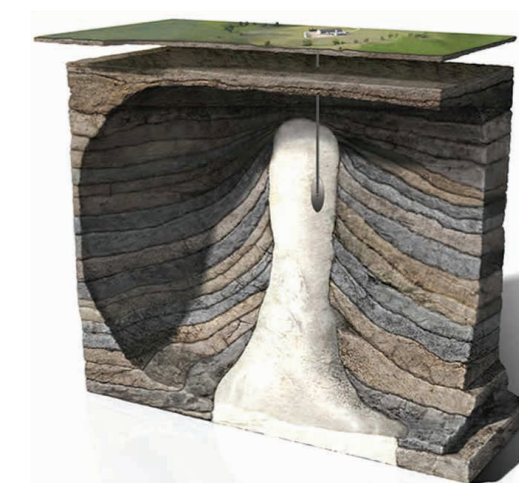
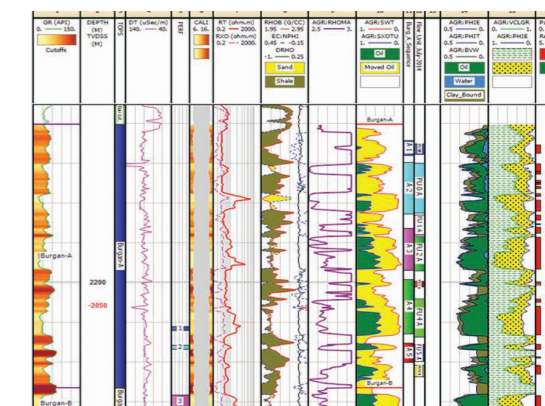
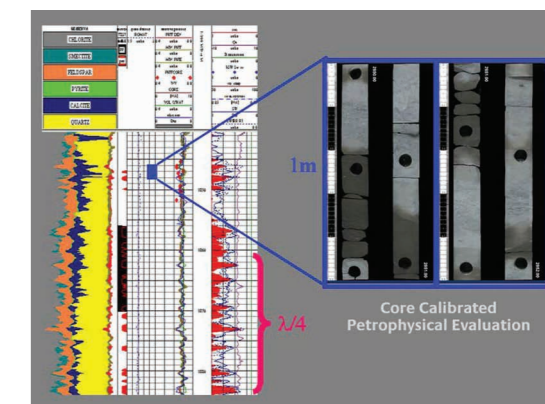
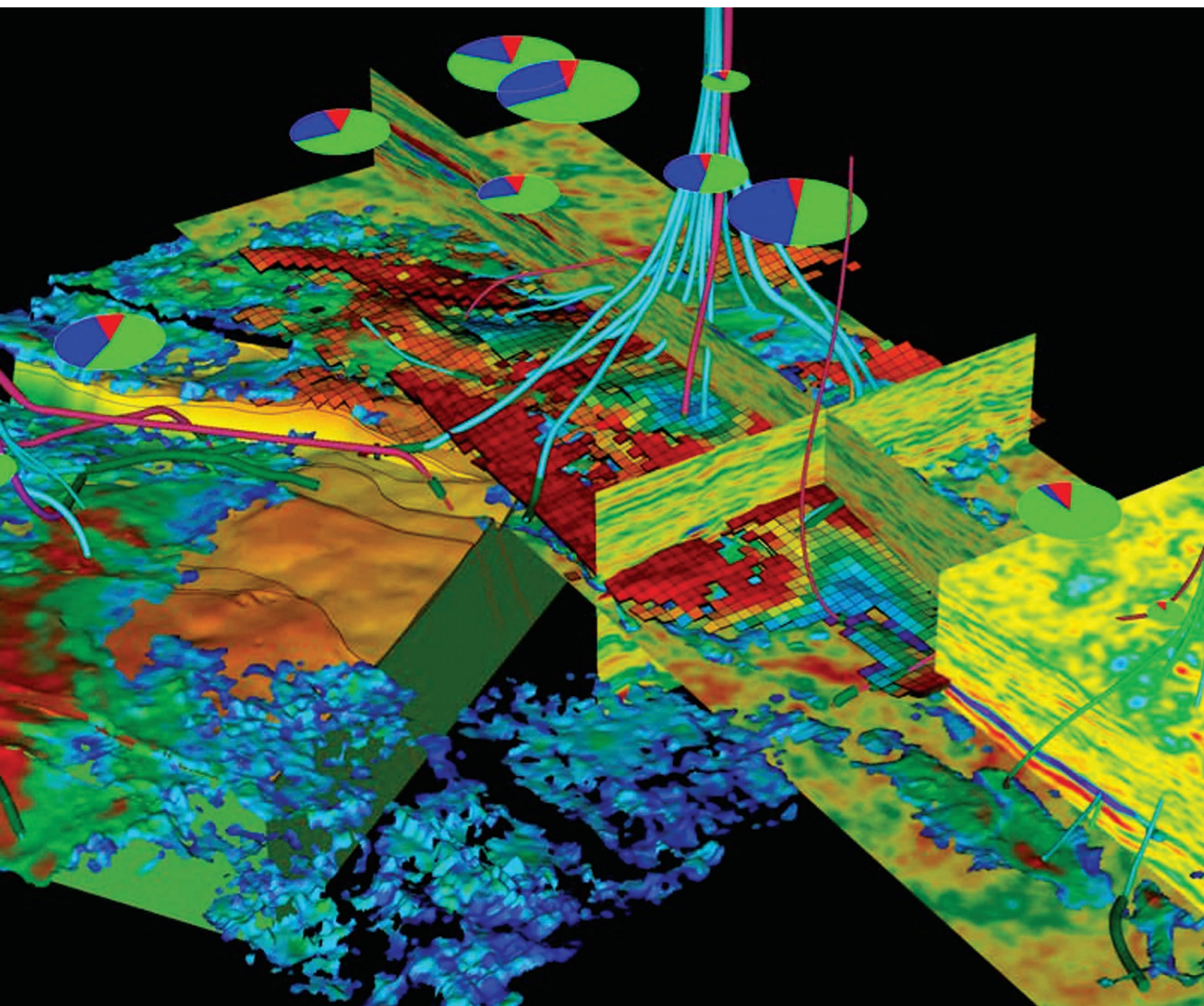
- Consists of below major tasks:
- Structural interpretation and modeling
 - Seismo stratigraphy interpretation
 - Reservoir characterization
 - Interpretation of salt diapirs in gas storage projects
 - Unconventional resources study
 - Geohazards study



RESERVOIR GEOSCIENCE & ENGINEERING

Reservoir geoscience and engineering (RGE) department of Dana Energy Company provides subsurface consulting services in the following areas of activities:

- Geological studies
- Petrophysical evaluations
- Prospect evaluation, reserve estimation and assessment
- Basic reservoir engineering studies
- Full-Field reservoir simulation and production optimization
- Managing multi-disciplinary and multi-organizational projects for underground natural gas storage (UGS). Each storage type has its own physical characteristics (porosity, permeability, retention capability, full geological and geophysical field and laboratory studies) and economics (site preparation and maintenance costs, deliverability rates, and cycling capability), which govern its suitability to particular applications.
- Economic analysis and master development plan (MDP) preparation and front end engineering documents (FEED)





HEALTH, SAFETY & ENVIRONMENT

Dana Energy directors and executive management is committed to provide a safe, positive and healthy working environment for all employees and subcontractors throughout its worldwide operations. In this reason as an IAGC active member, we have established HSE management system in our company and we follow the international HSE standards. This conviction is implemented by sound HSE management approach; identifying and assessing the health and safety risks and environmental aspects in all activities at planning stage in order to diminish and minimize those threats.

HSE GOALS:

- Achieving HSE international standards and their applications in all activities.
- Improve Personnel awareness on HSE issues by programmed training.
- Risk and Environment impacts reduction at work.

TO ACHIEVE THESE GOALS THE COMPANY PLEDGES:

- To apply recognized industry HSE standards and the company's own health, safety, and environment policies and procedures as strict guidelines for its day-to-day operations.
- To positively promote and mandate all personnel to include HSE management as an integral part of their daily work routine.
- To provide a Training program, for all personnel in each levels.
- To commit to continual improvement through proactive activities such as regular audits, training and HSE Meeting.

THE MAIN HSE ACTIVITIES IN THE PROJECTS ARE:

- Hazard identification, Risk & Environment aspects assessment of project activities and controlling the risks as preventive actions.
- Preparing the standard HSE Plan for the projects and monitoring its implementation.
- Planning to control the operation safely through regular and periodic Inspections& audits.
- Preparing the emergency response plan such as MEDEVAC and performing the drills to increase preparedness.
- Preparing the JOB Safety Analysis & Job safety instruction according to IAGC standards.
- Planning & Executing the HSE training program such as: First aid, Defensive driving, Mountain climbing, Firefighting & etc...
- Record, report and investigation of incidents to detect the root causes as lesson learned and taking corrective actions.
- Providing the proper PPE & firefighting and safety equipment for the projects.

