

StimPlan Version 4.0

We are in the midst of an exciting time at **NSI Technologies Inc.** This excitement stems from the fact that our state-of-the-art fracture design and analysis tool, **STIMPLAN**, is being transformed from the premiere fracture simulation tool to a petroleum engineering software system with unmatched capabilities.

Not only will the engineer be able to design and analyze a fracture stimulation but with the addition of a 3-D numerical reservoir simulator and an economics package, the user can conduct fracture optimization studies and fracture stimulation post appraisals to ensure that well performance and profitability are being maximized even in complex layered lithologies. **NSI Technologies Inc.** offers a complete line of PC based (WINDOWS 98, NT) well stimulation, design and analysis software. **STIMPLAN** is a state of the art software system that integrates a fracture geometry model, 3-D numeric reservoir simulator, and economics to allow fracture optimization, design, and stimulation post appraisal. The software package is modularized for user-friendly data input and results handling.

The Fracture Design Module includes two fracture simulators. **STIMPLAN** is a pseudo 3-D model that is a true numerical simulator performing implicit finite difference solutions to basic equations of mass balance, elasticity, height growth, and fluid flow. This simulator can be used for fracture design and analysis in complex situations involving fracture height growth, proppant settling, foam fluids, and tip screen-outs. **E-STIMPLAN** is an enhanced version of the model that includes a rigorous, fully numerical solution for two-dimensional fluid flow and proppant transport calculations.

E-StimPlan

The Fracture Optimization Module integrates the fracture design simulations with a numeric 3-D reservoir simulator and economics package to provide detailed production and economic optimization. With this module the user can ensure that the planned fracture stimulation will maximize both well performance and profitability.

The Analysis Module allows fracture pressure and production post appraisal. The pressure decline analysis function allows the user to interpret mini-frac pressure decline using the state-of-the-art fracture diagnostics to determine fluid efficiency and leak-off coefficient. It also allows pressure history matching and fracture redesign. Following the fracture stimulation, this module can also be used for post fracture production history matching with a 3-D numerical reservoir simulator to post appraise the effects of the stimulation and provide insights for future stimulation redesigns. Production type curve analysis techniques are also provided for quick user-friendly post appraisal.

In short, **STIMPLAN** is a software system designed to assist petroleum engineers in the rapid, easy design and analysis of well stimulations. Utilization of this tool can maximize well deliverability and profitability.

StimPlan 4.0

Platform - Available for WINDOWS 3.1, WINDOWS 95, 98, and NT. Can be made available for other 32 bit platforms as demand dictates.

Distribution - scheduled maintenance update for **StimPlan 4.0** is December, 1999.

Lunch and Learn Seminars have been conducted in Lafayette Louisiana and Houston, Texas in recent days and **NSI** wishes to thank everyone that participated. The primary focus of these first sessions has been on the perforation strategy for frac-pack completions. Feedback from these sessions has been extremely positive and more are being planned in the near future. If you or your company are interested in hosting and/or attending one of these sessions please contact Larry Britt at 918-496-2071 (INFO@NSITECH.com)

StimPlan User Courses are being taught. These one day courses are designed as hands on instruction on the application of **STIMPLAN** and **E-STIMPLAN** to solve many of the petroleum engineers stimulation design and analysis problems. The objective of these courses is to maximize user ability to solve completion and stimulation problems by highlighting the tremendous capabilities of **StimPlan**. If you or your company are interested in hosting and/or attending one of these courses please contact Mike Smith at 918-496-2071 (INFO@NSITECH.com)!



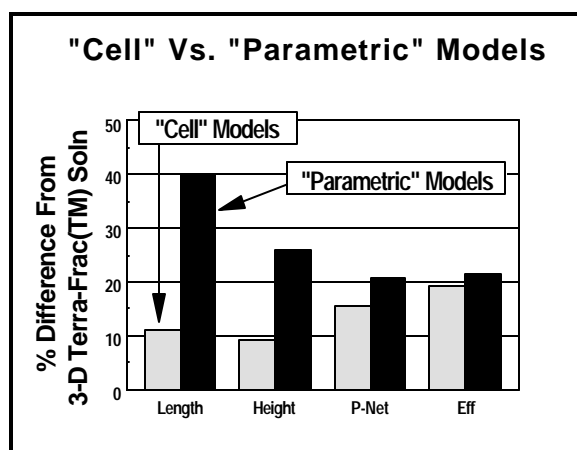
StimPlan Features and Plans

	Status of Effort	Target Date
StimPlan Functionality		
3-D Numeric Reservoir Simulator	Beta Testing	Jan 2000
Economics Model	Beta Testing	Jan 2000
Integrated (Fracture, Reservoir, Economics) Optimization Scheme	Beta Testing	Jan 2000
Production Decline Analysis and Fetkovich Type Curve Matching	Beta Testing	Jan 2000
Carter and Agarwal-Gardner Type Curve Matching Capabilities	Designing	Jan 2000
Automated optimization and analysis of refracturing candidates	Beta Testing	Jan 2000
Horizontal well and multi-fractured horizontal well optimization and analysis	Beta Testing	Jan 2000
Upgrade 3-D Numeric Reservoir Simulator to include Non-Darcy Flow	Ongoing	Jan 2000
Graphical log input for geo-mechanical and fluid loss layering	Planning	Jun 2000
Rigorous natural fracture fluid loss calculations	ID Support	?
Measured Depth/TVD Option	Planning	Mar 2000
Enhanced Database Features including Rock Mechanics	Planning	Jun 2000
Pre Closure Pressure Decline Analysis for Permeability (after Ispas et al)	Designing	Mar 2000
After Closure Analysis (after Nolte et al)	Designing	Mar 2000
Expansion of Help System	Planning	Mar 2000
E-StimPlan Functionality		
FEM generated discrete stiffness matrix for layered Modulus	Ongoing	Jan 2000
Acid Fracturing Module	ID Support	?
Upgrade Pre Closure Permeability w/ time and closure varying "Stiffness"	ID Support	?

Acid & Natural Frac's

If you have a need for the design and analysis of acid fracture stimulations and/or stimulations in naturally fractured reservoirs please telephone 918-496-2071 and ask for Mike Smith or Larry Britt or send an E-Mail to us at INFO@NSITECH.com. We are in the process of putting together a consortium of companies with similar stimulation design and analysis needs. The objective of the effort will be to develop a tool which rigorously handles the anomalous and excessive leak-off associated with acid fracturing and in stimulations of naturally fractured reservoirs. Call today to join this

StimPlan Matches Terra-Frac –At the heart of **StimPlan** is a stable, routine, analysis and design tool with more than 15 years history of development and use. In a recent comparison of fracture models (Warpinski, N. R., et al, "Comparison Study of Fracture Models," *SPE Production and Facilities*, February, 1994) "cell" type PC models such as **StimPlan** gave much better agreement with the more complex work station model, Terra-Frac (TM of Terra-Tek, Inc.), than the



"parametric" models, with **StimPlan** giving the best overall agreement as illustrated in the figure. The package runs on PC computers and has worldwide users in

Australia, North and South America, China, and Europe, including company-wide use by major oil companies.

StimPlan 3.11 Features

The current version of **StimPlan** has many useful features. These include:

- a complete GUI based graphical mini-frac analysis including stress tests, step-rate tests, net pressure analysis, pressure decline analysis, etc.;
- includes completely flexible data import for utilizing recorded data from any source - surface, downhole, memory gauges, etc.;
- import data from multiple sources, delete/reduce data as needed, synchronize multiple data files in time, and merge data from various sources into one data set for analysis;
- measured data directly transferred to simulator for pressure history matching;
- import data for actual surface pump schedule, shift to a "downhole" schedule and transfer directly to simulator for analysis;
- compare design versus actual schedules;
- inclusion of "Predicted" Surface Pressure versus Time calculations and plot; and
- allows input of "ramp" type pump schedule (either PPG increasing with fluid volume or increasing with slurry volume).

StimPlan a software system for well completion and stimulation design and analysis! Order Now at INFO@NSITECH.com!