New Software!

The SPE Annual Technical Conference in New Orleans will be an opportunity for Fekete to showcase two new software products: F.A.S.T. PoolSim™ and F.A.S.T. CashPot™ (see pages 2 and 3 respectively for details). In addition, we’ll be demonstrating F.A.S.T. WellTest™ and F.A.S.T. Piper™ which we are proud to say have received enthusiastic approval throughout the USA. Bring your challenging technical problems and play “stump the experts”. Visitors to our booth can take home a CD containing fully-functional, time-limited demonstration copies of all six Fekete software programs.

Free Software!

Fekete has two utility software programs that we have used in-house for years. The first program, F.A.S.T. Volumetrics™, calculates volumetric oil and gas reserves. The second program, F.A.S.T. Recomb™, calculates the original rich gas stream composition from separate gas and liquid sample analyses. The software is available to everyone (whether an existing Fekete client or not) by visiting our homepage at or by stopping at our booth during the SPE Conference in New Orleans.

For details on all our software products and engineering services, visit our updated homepage at http://www.fekete.com

INSIDE THIS ISSUE

SPE Annual Technical Conference 1
Tech Talk: Streamline Analysis featuring F.A.S.T. PoolSim™ 2
Introducing F.A.S.T. CashPot™ 3
Wasn’t that a Party! 4
Comings and Goings 4

OUR NEXT ISSUE

You’ve seen our Software, now try our Service!
A streamline is simply “the path in the reservoir (the trajectory) that a particle of fluid would follow”. In practice, the streamline generation is accomplished by first calculating the pressure at all points in the reservoir, then determining the gradient in the x and y directions and finally by vectorial summation of the pressure gradients, dp/dx and dp/dy. The Exponential Integral solution and the Principle of Superposition in “space” and “time” are used to account for multiple wells and rate changes (Mathews and Russell SPE Monograph 1).

Currently, we are able to model an unbounded, homogeneous reservoir. The reservoir is divided into a regular rectangular grid pattern, with the grid points located 264 feet apart (1/20th of a mile). The start and end times of the forecast are specified, and the forecast duration is subdivided into consecutive logarithmic based sequences, every time there is a rate change in any well. This permits viewing the very rapid pressure changes that occur at the start of a rate.

Oil flow is treated as a single phase. Gas is handled through the use of pseudo-pressure (ERCB Guide G-3 “Gas Well Testing Theory and Practice”). A mixture of gas, oil and water is dealt with by using the total reservoir fluid flow concept, qtBt, proposed by Perrine. (We are finalizing a research project to generate a multiphase pseudo-pressure).

F.A.S.T. PoolSim™ is another of the F.A.S.T. (Fekete Advanced Software Technology) suite of software products. The name stands for Pool Simulator as the program is an analytical reservoir simulator which will generate the pressures and streamlines anywhere in a reservoir, for any number of wells, and any complex flow history.

The visual displays are impressive, thus creating a clearer understanding of fluid flow in a reservoir:
- watch the radius of drainage grow in time in 2D plan view or cross-section, or in 3D perspective from any rotational angle using “streamline”, “wire mesh” or “amorphous blobs” format.
- see no-flow boundaries being formed between any number of wells.
- observe the changes caused by any sequence of unequal multi-rate flows or shut-ins.
- actually “see” the interference patterns between wells.
- generate the streamlines between injectors and producers, and note the unswept portions of the reservoir.
- learn how far you can investigate in a buildup compared to a drawdown.
- calculate the interference effects at a shut-in or flowing well, caused by several wells flowing at varying rates for different durations.
- create pressure “craters” or even “black holes”!

**Application: How can I determine an optimum well spacing?**

In the example below, the reservoir between the wells (which are 800 metres apart) depleted 250 kPa after 1 year of production. At this rate, it will take more than 20 years to deplete this reservoir. A smaller well spacing is desirable (keeping economics in mind).

**Future versions of F.A.S.T. PoolSim™ will incorporate wellbore storage and skin as well as reservoir anisotropy and mixed reservoir boundaries.**

F.A.S.T. CashPot™ is Fekete’s latest software release. Finally, there is a CLEAR AND UNDERSTANDABLE presentation of risk. Yes folks, no more statistical blues. As is the case with all Fekete software, F.A.S.T. CashPot™ was written for our internal use before release to the industry. It has been tried, tested and refined. Not only do you get the software, but it is backed by Fekete’s Reservoir Evaluation team who use the software in our Risk Assessment Reports.

The software was written in response to our internal need for a better, faster and less expensive solution to the cumbersome (and often poorly understood) Monte Carlo process. Also, we strove to develop a unique graphical presentation to summarize the mass of output data in a comprehensive, yet easy to understand, presentation. While Monte Carlo is a technically valid approach, it is our experience that the method is generally used only on very large scale projects where the time and effort can be justified. It is essential however, that all producing companies, regardless of project size, address risk assessment as part of their overall fiscal management.

We have found that most companies (other than the majors) cannot justify a full-time statistical specialist and end up doing some form of ad-hoc risk assessment (generally on a spreadsheet). F.A.S.T. CashPot™ removes the statistical worries and leads you through a rigorous (but flexible) risk assessment procedure. This allows your team of geologists and engineers to focus on the technical issues.

See the Difference Between CashPot™ and Traditional Methods of Risk Assessment

**Traditional**

- **SINGLE VALUE**
  - Traditional methods use a single value for each parameter.
  - It is much harder to achieve consensus for a single point value than for a range of reasonable values.

- **INDEPENDENT EVALUATION**
  - The professional groups usually work independently of each other.
  - The synergy of teamwork is often lacking.

- **RESULTS CAN BE CONFUSING**
  - Applying statistics to traditional calculations may leave the professionals unclear about the final results or frustrated with the statistical process. As a consequence, the results of the risk analysis may not be clearly understood nor readily accepted.

**CashPot™**

- **RANGE OF VALUES**
  - CashPot™ uses the whole range of reasonable values for each parameter.
  - CashPot™ computes a risk profile using these ranges of possibilities.

- **INTEGRATED TEAM**
  - The technical experts in the team determine the risks for each variable in their own field of expertise.
  - CashPot™ honors these independently assessed risks and integrates them into the whole project when calculating the Chance of Success.
  - The professionals can see directly how the range of values they provided affects the Chance of Success.

- **RESULTS ARE CLEARLY UNDERSTOOD**
  - All professionals clearly see the results of the risk profiles.
  - CashPot™ takes care of the statistics, freeing up the professionals to focus on their technical expertise.
  - CashPot™’s Investment Graph clearly displays the financial risk of the project.

For more information, or to receive a demo disk, please contact Vickie Darago at (403) 213-4200 or toll free from the USA 1-800-625-2488.

Advanced Welltest Analysis Research

We are pleased to be hosting three researchers from the Southwest Petroleum Institute (SWPI) of Nanchong, China. In collaboration with Louis Mattar of Fekete and Miran Pooladi-Daarvish from the University of Calgary, the team is researching pressure transient analysis techniques to be used when multiphase flow occurs in the reservoir (i.e. solution gas drive or retrograde condensate). Determination of the reservoir effects will be in addition to pressure dynamics caused by multiphase flow in the wellbore.

The research team of Mr. Liu Qiguo, Mr. Hu ZE and Mr. Chen Xiaofan from SWPI.

Fekete to teach Risk Assessment in China

Ray Mireault leaves in October for three weeks in Nanchong, China to teach his Risk Assessment course at the Southwest Petroleum Institute.

We are also planning to present Ray’s course in a number of USA and Canadian locations over the next 8 months. Dates will be finalized as demand dictates. All Fekete courses are also available worldwide to in-house groups of eight or more. If you want to place your name on the list for the next available course, please contact Jennifer Day in Calgary at (403) 213-4200 or toll free from the USA 1-800-625-2488.

In the meantime, a copy of Ray’s latest paper “Evaluating and Managing Risk in the Western Canadian Sedimentary Basin” (as well as all Fekete technical papers) is available for downloading from our website at www.fekete.com.
News & Notes

WASN’T THAT A PARTY!

The consensus was unanimous, from clients and staff, that Fekete’s 25th anniversary party on June 4th was an unqualified success. Held at the Capital Bar and Grill in Calgary, 450 people enjoyed a relaxed evening of food and conversation.

Comings and goings...

We need to say both welcome and goodbye to this year’s crop of summer students. Paul Johnson and Kern Shepperd are both back for the third summer, this time in the Programming Group. In the same group we were pleased to have Mathieu Fenniak for the first time.

Also new this year are Andrew Williams and Rochelle Braatz. Both are University of Calgary summer students and are helping out in the Reservoir Evaluation Group.

Lana Thompson is a new addition to the support staff. Karie Wasut is now the receptionist as Christine Sipos moves into a geological technician role.

Amy Dunfield will be with us for another year as she is on a 16 month co-op term from the University of Calgary. She is currently working with Louis Mattar in the WellTesting Group.

Sarah Williams recently graduated from the University of Calgary in Chemical Engineering and is starting her on-the-job training with Ray Mireault in the Production Optimization Group.

Finally, the editor of this newsletter has taken some serious heat over his neglect in mentioning the addition of Chad Thompson to Fekete’s staff. Chad started in July/97 and is working in Gary Metcalfe’s Reservoir Evaluation Group.

Sadly, we said goodbye to two colleagues. Deepa Thomas is well known to many of our welltesting clients. She decided to try her hand in the heavy oil group at Gulf. We wish her all the best (Reza says hi!). Also, Brenda (B.J.) Leong is now the welltesting co-ordinator for the Palliser Business Unit at PanCanadian. We also wish her well.

Course Updates

Louis Mattar and Ralph McNeil completed a successful week of WellTest and Piper Courses in Houston during the second week of June. Ralph will also be making a Gas Gathering System Optimization presentation at the SPE Eastern Regional Meeting in Pittsburgh on Nov. 12/98.

More courses are planned for Fall 1998. Dates will be finalized as demand dictates. If you want to place your name on the list for the next available course, please contact Jennifer Day in Calgary at (403) 213-4200.

WASN’T THAT A PARTY!

It was a pleasure for everyone at Fekete to meet and mingle with our Calgary clients on an informal basis.

For our USA clients, we hope you’ll be able to stop in and visit Louis, Ed, Marty and Tammie in our booth at the SPE Annual Technical Conference in New Orleans.

Comings and goings...

We need to say both welcome and goodbye to this year’s crop of summer students. Paul Johnson and Kern Shepperd are both back for the third summer, this time in the Programming Group. In the same group we were pleased to have Mathieu Fenniak for the first time.

Also new this year are Andrew Williams and Rochelle Braatz. Both are University of Calgary summer students and are helping out in the Reservoir Evaluation Group.

Lana Thompson is a new addition to the support staff. Karie Wasut is now the receptionist as Christine Sipos moves into a geological technician role.

Amy Dunfield will be with us for another year as she is on a 16 month co-op term from the University of Calgary. She is currently working with Louis Mattar in the WellTesting Group.

Sarah Williams recently graduated from the University of Calgary in Chemical Engineering and is starting her on-the-job training with Ray Mireault in the Production Optimization Group.

Finally, the editor of this newsletter has taken some serious heat over his neglect in mentioning the addition of Chad Thompson to Fekete’s staff. Chad started in July/97 and is working in Gary Metcalfe’s Reservoir Evaluation Group.

Sadly, we said goodbye to two colleagues. Deepa Thomas is well known to many of our welltesting clients. She decided to try her hand in the heavy oil group at Gulf. We wish her all the best (Reza says hi!). Also, Brenda (B.J.) Leong is now the welltesting co-ordinator for the Palliser Business Unit at PanCanadian. We also wish her well.

Course Updates

Louis Mattar and Ralph McNeil completed a successful week of WellTest and Piper Courses in Houston during the second week of June. Ralph will also be making a Gas Gathering System Optimization presentation at the SPE Eastern Regional Meeting in Pittsburgh on Nov. 12/98.

More courses are planned for Fall 1998. Dates will be finalized as demand dictates. If you want to place your name on the list for the next available course, please contact Jennifer Day in Calgary at (403) 213-4200.

FEKETE ASSOCIATES INC.
2000, 540 - 5th Avenue S.W.
Calgary, Alberta, Canada T2P 0M2
Ph: (403) 213-4200 Fax: (403) 213-4298
U.S.A. : 1-800-625-2488
E-Mail: fast@fekete.com

FEKETE AUSTRALIA PTY. LTD.
16 Ord Street, P.O. Box 1466
West Perth, WA
Australia, 6872
Ph:08-93210025 Fax:08-93210024
E-Mail: fast@fekete.com.au

We invite you to review further information on Fekete on our web sites: http://www.fekete.com and http://www.fekete.com.au