



# THE CWB INSIDER

A CLEARWATERBAY TECHNOLOGY INC. QUARTERLY

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## SPECIAL POINTS OF INTEREST:

- **TECH TIP: Steps in Energy Study**
- **Check out our up-graded website**
- **Training Courses**

## STEPS IN AN ENERGY STUDY - PART I

Let us continue with the discussion on the energy study issues. The first two discussions we had in the previous newsletters were on the following topics: **(July08) Energy savings study does not always mean heat exchanger networking** and **(Oct08) Data should represent the heating and cooling demand of the process and not just the existing exchanger heat duties**. As discussed in the Table 1 of the October 2008 issue, there are seven steps in an energy study exercise. The first step – data collection, is probably the most important step simply because all the subsequent calculations and analyses are based upon these data. Consequently, if wrong data are used, wrong answers will be obtained.

The data that are used in Pinch Analysis are called “Stream Data”. (Note that they are not called “Heat Exchanger” or “Heat Transfer” data). The reason is that we would like to consider the heating and cooling demand of the process to identify the lowest possible energy consumption for the system. That is something that is often overlooked. **Step 1 is Data Collection**. For stream data, as described by its name, we are interested in the process streams, i.e. from one unit operation to another unit operation. What is the process temperature and pressure coming out of one unit operation; and what is the required temperature and pressure for the next unit operation such that both unit operations (from and to) can be operated and perform their desired functions correctly. In doing so, we can also tie it up to the modification of unit operations which will be discussed in next issue.

**Step 2: Data Check** is basically a consistency check on the heat and material balance of the system. Since our data are based upon live plant information, it is virtually impossible to collect a set of steady state data. Consequently, it is necessary to apply our chemical engineering knowledge to judge and reconcile the data such that we have balanced information.

**Step 3: Base Case Utility** is basically an account-

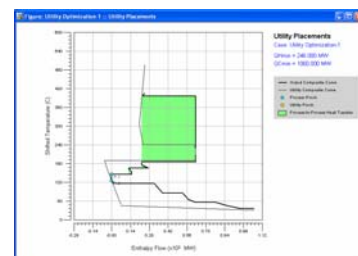
tancy exercise. We need to find out how much utility is being used and at what levels. More importantly, it is necessary to understand the utility system, i.e. how the utilities are being supplied to the system. This topic falls more under the discussion of *Total Site Analysis*. However, for *Pinch Analysis* purpose we need to know the levels of utilities available and how they are being generated.

**Step 4, Targeting** is what we would like to discuss in more detail. With the stream data obtained and chosen  $\Delta T_{min}$ , using CWB Tech’s software for Pinch Analysis, the “Composite Curves” and the “Grand Composite Curve” can be generated.

What is the significance of the Composite Curves and the Grand Composite Curve?

- Composite Curves indicate
  - ⇒ The Process Pinch location
  - ⇒ Near-Pinch locations
  - ⇒ Available driving forces between the hot and cold sides
- Grand Composite Curve
  - ⇒ Enthalpy balance at various level of utilities

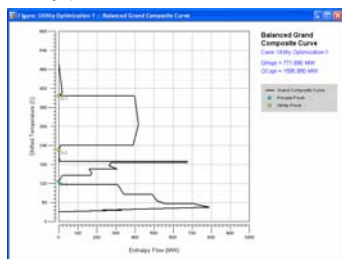
Figure 1: Grand Composite Curve, with utility placement



Another useful graphical representation of the system is the balanced composite curve and the balanced grand composite curve. They are basically similar to the “unbalanced” curves described above. However, one of the advantages of this curve is that one can identify the utility pinches with ease. Considering the following balanced grand composite curve, wherein

the utility pinches are marked.

Figure 2: Balanced Grand Composite Curve, shows utility pinches too



Furthermore, after also extracting the heat trans-

fer coefficient contribution for the streams, we can also calculate the "Area target". These will be used to study the potential for savings using the Area-Energy target plot, as explained in the July 2008 issue.

A wrap-up and discussion on the remaining steps, namely generation and use of Process Modification Ideas will be dealt with in the next issue.

To obtain an evaluation version of our new software for Pinch Technology "PINCH ANALYSIS", email us at [sales@cwbttech.com](mailto:sales@cwbttech.com).

## AICHE DAY

This one-day Conference developed by AIChE, the world's largest association for chemical engineers, offers a series of condensed short courses which provide innovative insights and solutions for your projects based on chemical engineering principles (registration required)

AIChE is organizing an entire day of tightly structured half day tutorials on subjects of immediate interest to those working in chemical engineering or related disciplines. These mini-courses emphasize the practice rather than the theoretical. For more information, check <http://chemshow.com/forvisitors/education.php>

Our talk on "Integrative Approach to Crystallization Process Development" is on Tuesday, No-

vember 17, 2009 at 12.30pm.

*What can you expect to learn?*

- How to analyze solubility and SLE phase behavior for the purpose of conceptual design of crystallization processes
- How to use the knowledge of SLE phase behavior in synthesizing crystallization processes and defining the optimum processing conditions
- How to apply fundamental understanding and integrate synthesis, analysis, and experimental effort in developing crystallization processes
- How to solve practical industrial problems in the chemical, fine chemical, and pharmaceutical industries using the integrative approach

## UPCOMING TRAINING COURSES/TRADESHOW

Date	Venue	Title	Registration
Nov. 8, 2009	Nashville, TN (AIChE Annual Meeting)	Crystallization Process Development: From Lab to Plant	<a href="http://www.aidhe.org/conferences/09annual/shortcourses.aspx">http://www.aidhe.org/conferences/09annual/shortcourses.aspx</a>
Nov. 17, 2009	New York, NY (Special AIChE Day at 2009CHEM SHOW)	Integrative Approach to Crystallization Process Development	<a href="http://chemshow.com/newpress/newsitems/aicheday.php">http://chemshow.com/newpress/newsitems/aicheday.php</a>
Nov. 18-20, 2009	Tokyo, Japan	Exhibitor booth with I.T. Solutions at "InChem Tokyo 2009"	<a href="http://www.jma.or.jp/inchem/en/exlist/index.html">http://www.jma.or.jp/inchem/en/exlist/index.html</a>
Dec. 10-11, 2009	Atlanta, GA	Multi-disciplinary Process Development (ASME Course CH757)	<a href="http://catalog.asme.org/Education/ShortCourse/MULTIDISCIPLINARY_PROCESS.cfm">http://catalog.asme.org/Education/ShortCourse/MULTIDISCIPLINARY_PROCESS.cfm</a>

For detailed information on our upcoming training courses, contact us at [shortcourse@cwbttech.com](mailto:shortcourse@cwbttech.com), or Hideo Iketani of I.T. Solutions at [iketani@its-ykh.co.jp](mailto:iketani@its-ykh.co.jp)

## UPDATED WEBSITE

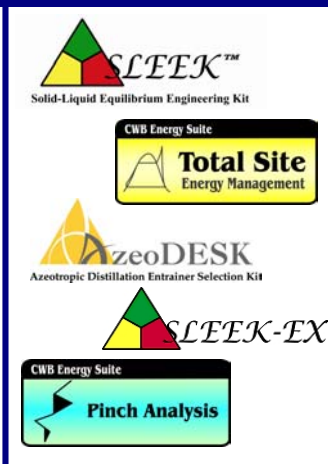
Read our website for new information about our software products, technology and process development expertise.

You can also download our brochures/newsletters and apply for an evaluation version of our softwares.

On the web at:  
[www.cwbttech.com](http://www.cwbttech.com)



## CWBTECH PRODUCT SHOWCASE



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