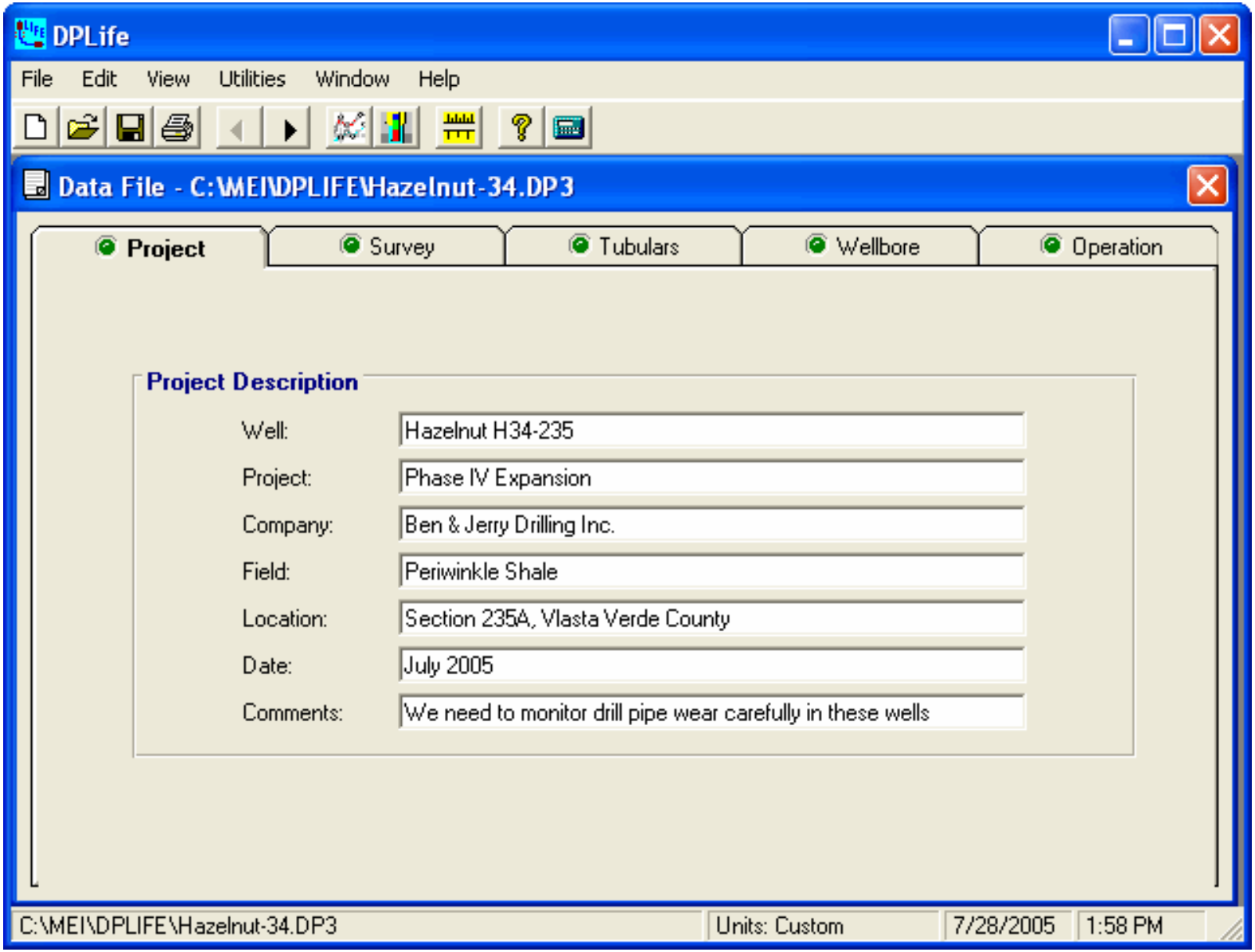
DPLIFE – Drill-String Fatigue Life Model

Failures of tubulars from fatigue are very costly in terms of lost rig time, lost tubular goods, and even lost wells. DPLIFE helps predict and prevent drill-string failure and costs associated with it. The program predicts dogleg limits, maximum drill-string bending stresses, cumulative fatigue damage, and total time and rotation of drill-string tubulars.

Two mechanical models are included: (1) fatigue and (2) crack-growth models. The crack-growth model is based on correlations of drill-string tubulars by Exxon, and predicts inspection intervals to prevent fatigue failure.



DPLIFE is a user-friendly engineering model with powerful features. The first input screen (the Project page) stores project documentation.

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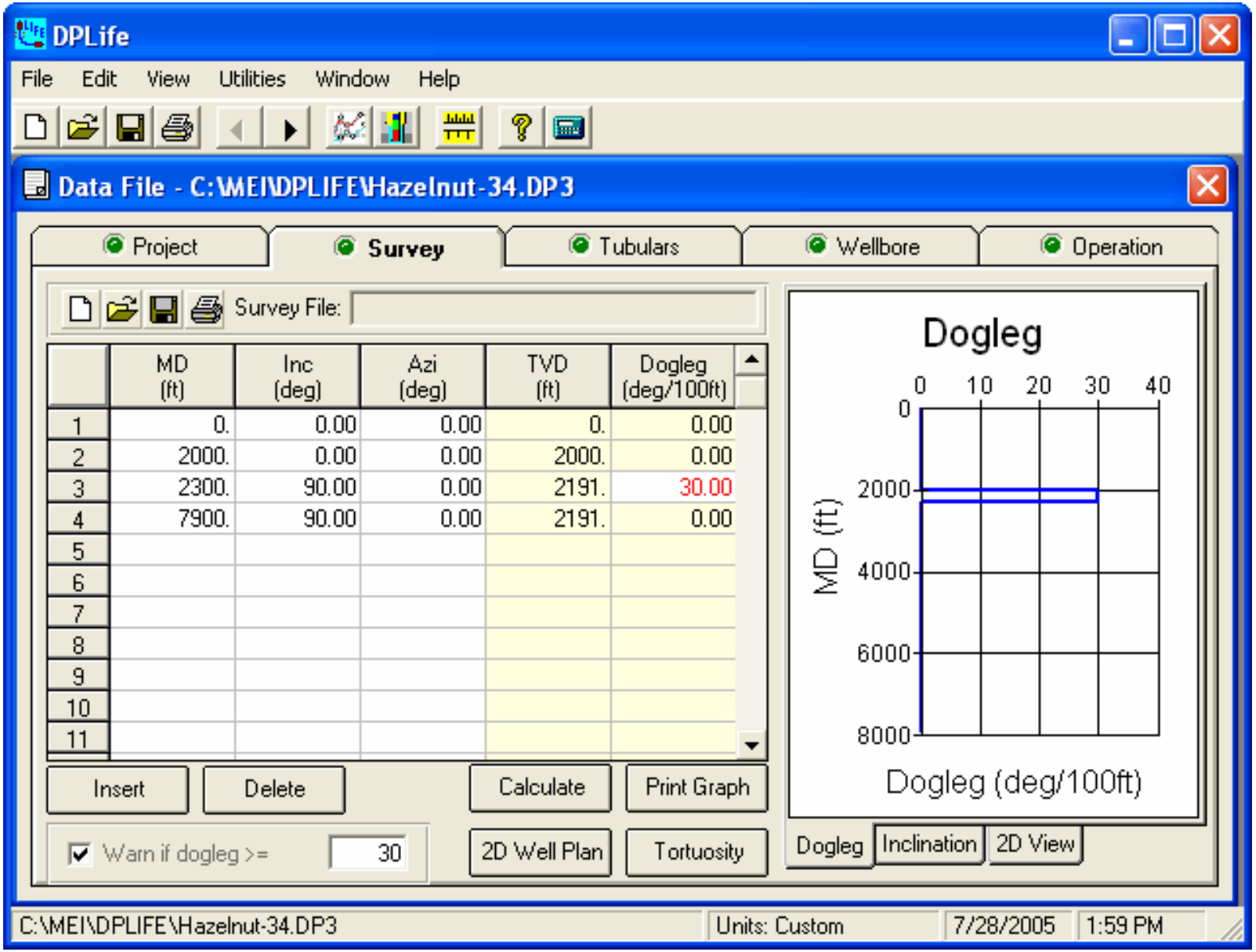

The **Survey** page is for entering the wellbore survey that describes the well trajectory. Data may be entered manually, imported, exported, or copied from a spreadsheet. Don't have a survey? Create one quickly with the handy 2D Planner utility.

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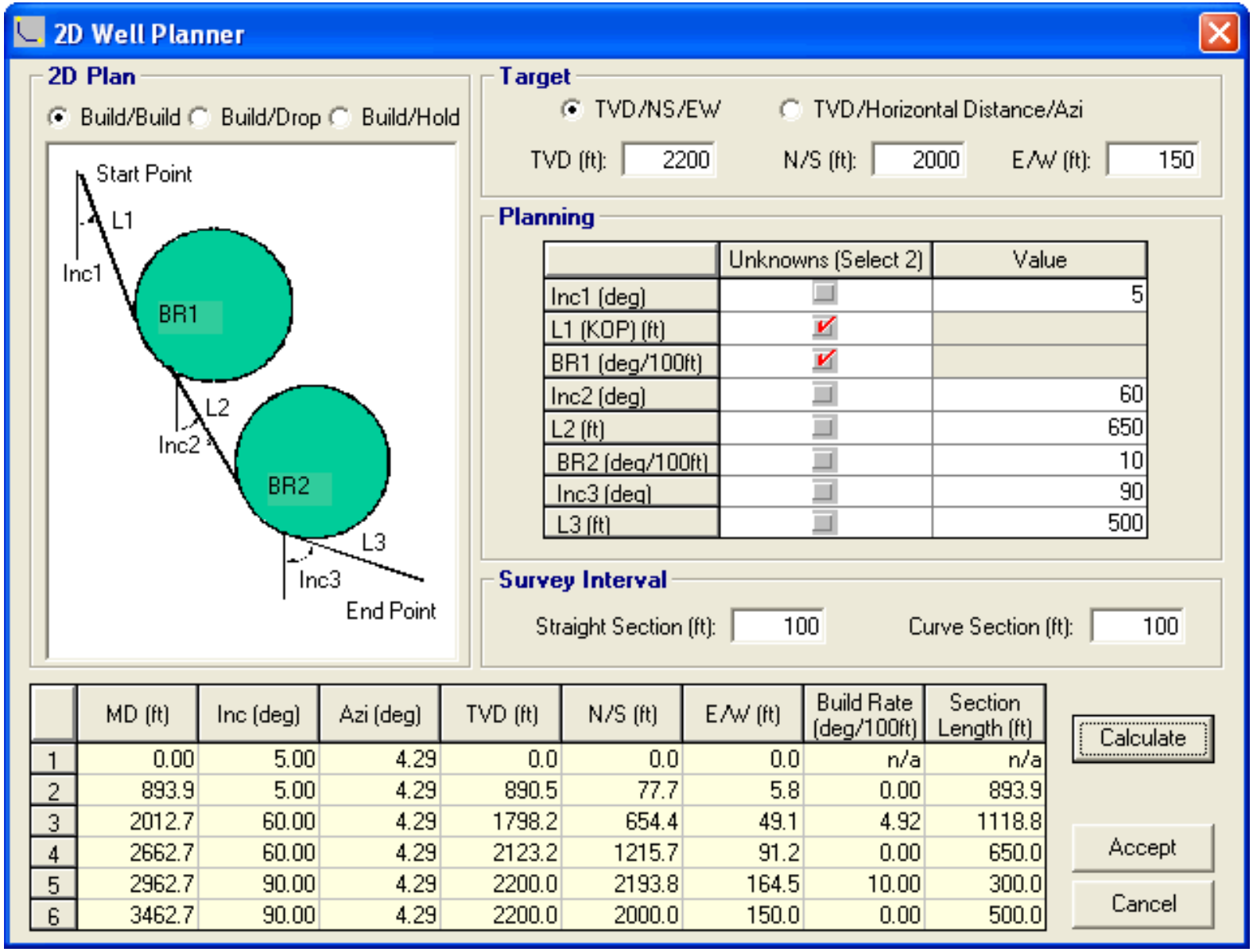

The **2D Planner** allows you to quickly create simple or complicated well surveys. Choose the basic well shape and enter starting values for the primary geometric parameters. After creation, the new survey is automatically exported back to the Survey page.

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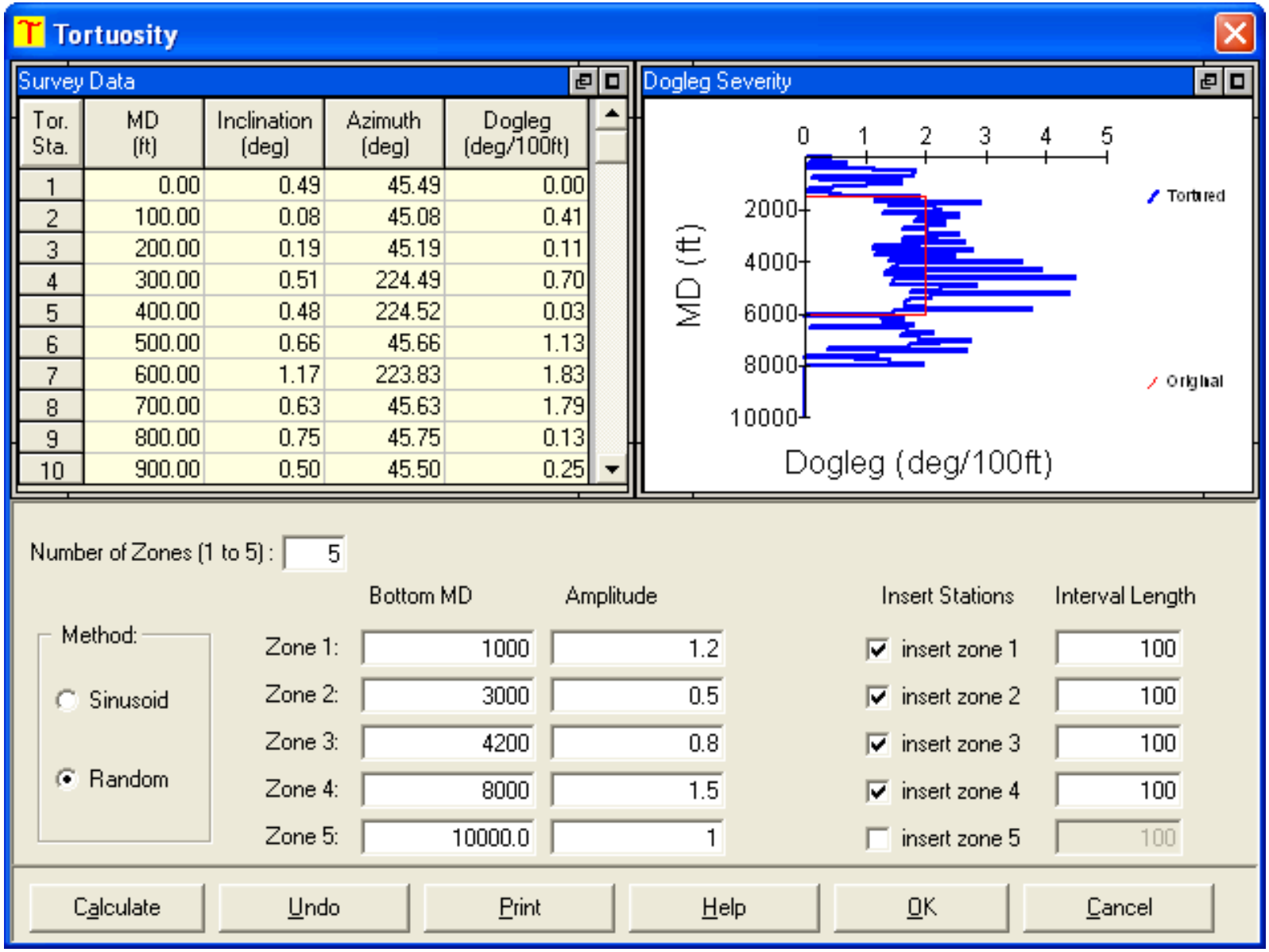

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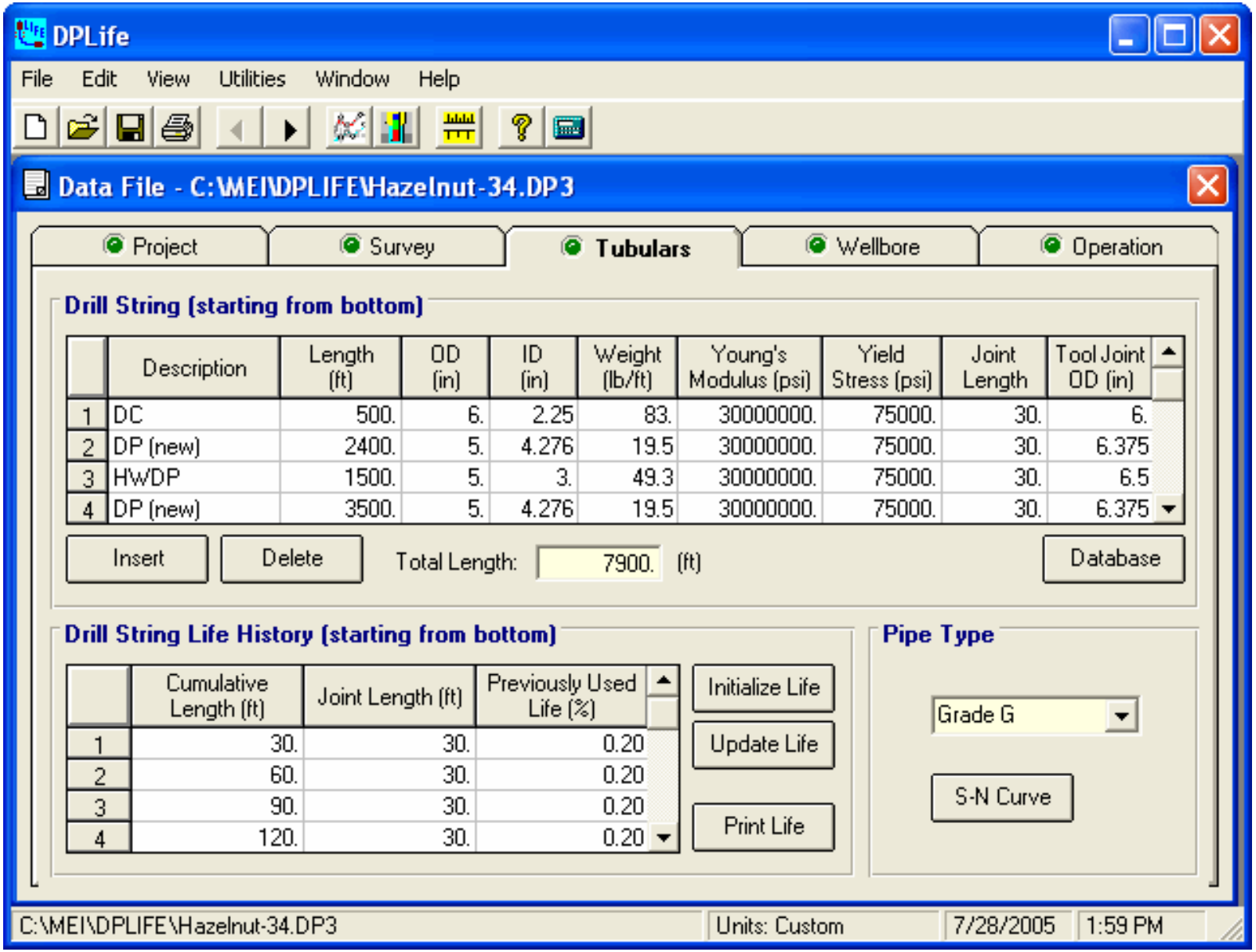
Another important utility is the **Tortuosity** window. Ideal well surveys need to be “tortured” to add imperfections similar to those found in real wells. This well has been divided into five separate segments, each with its own tortuosity. The original survey is in red; the tortured survey is in blue.



On the **Tubulars** page, drillstring components are specified in detail. For each joint, enter the fatigue life previously consumed by field operations. Predicted life is added after calculations are complete.

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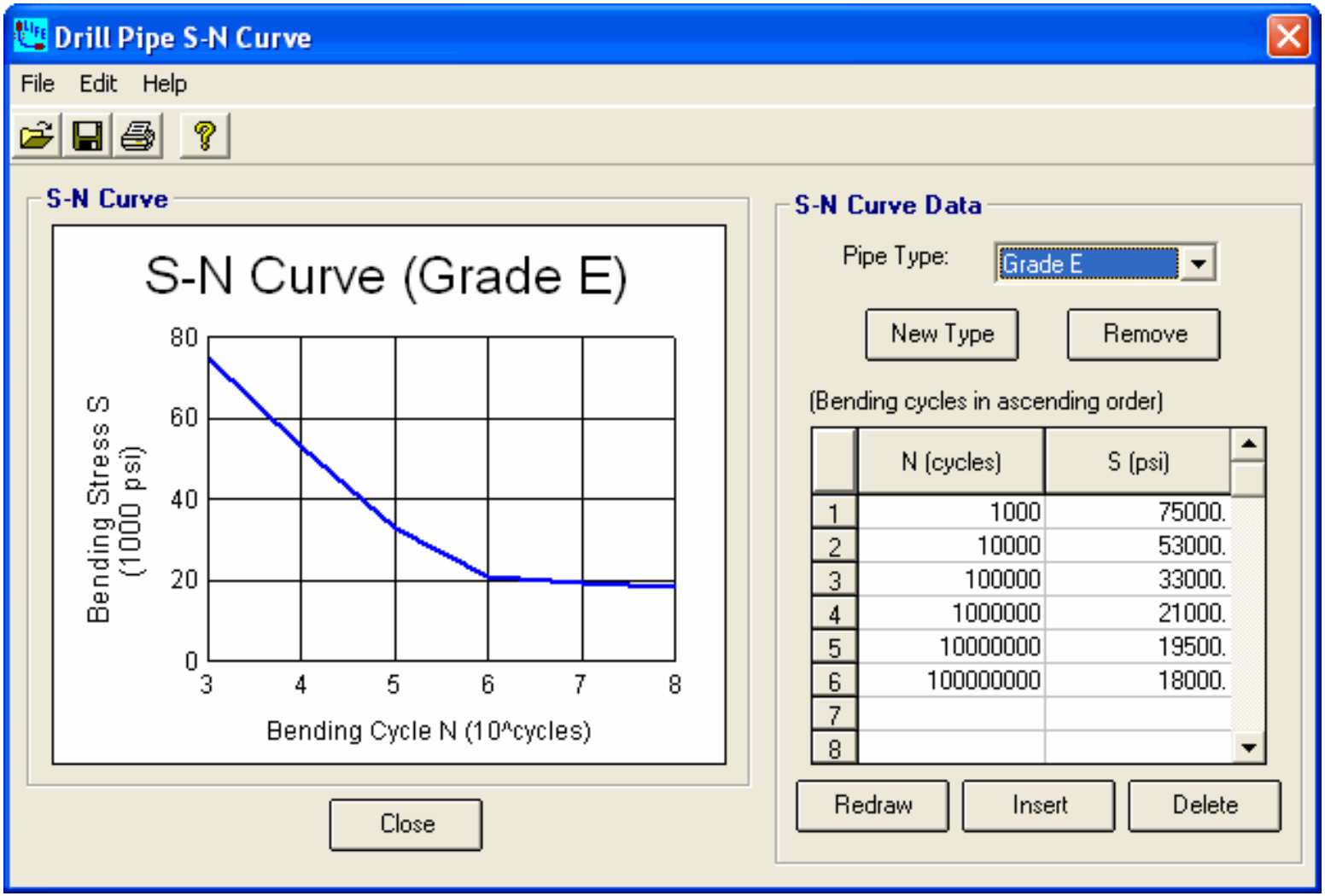

Maximum fatigue life is specified via S-N curves, which are provided for various materials and grades. Existing fatigue data may be edited and/or new curves for other materials added as required.

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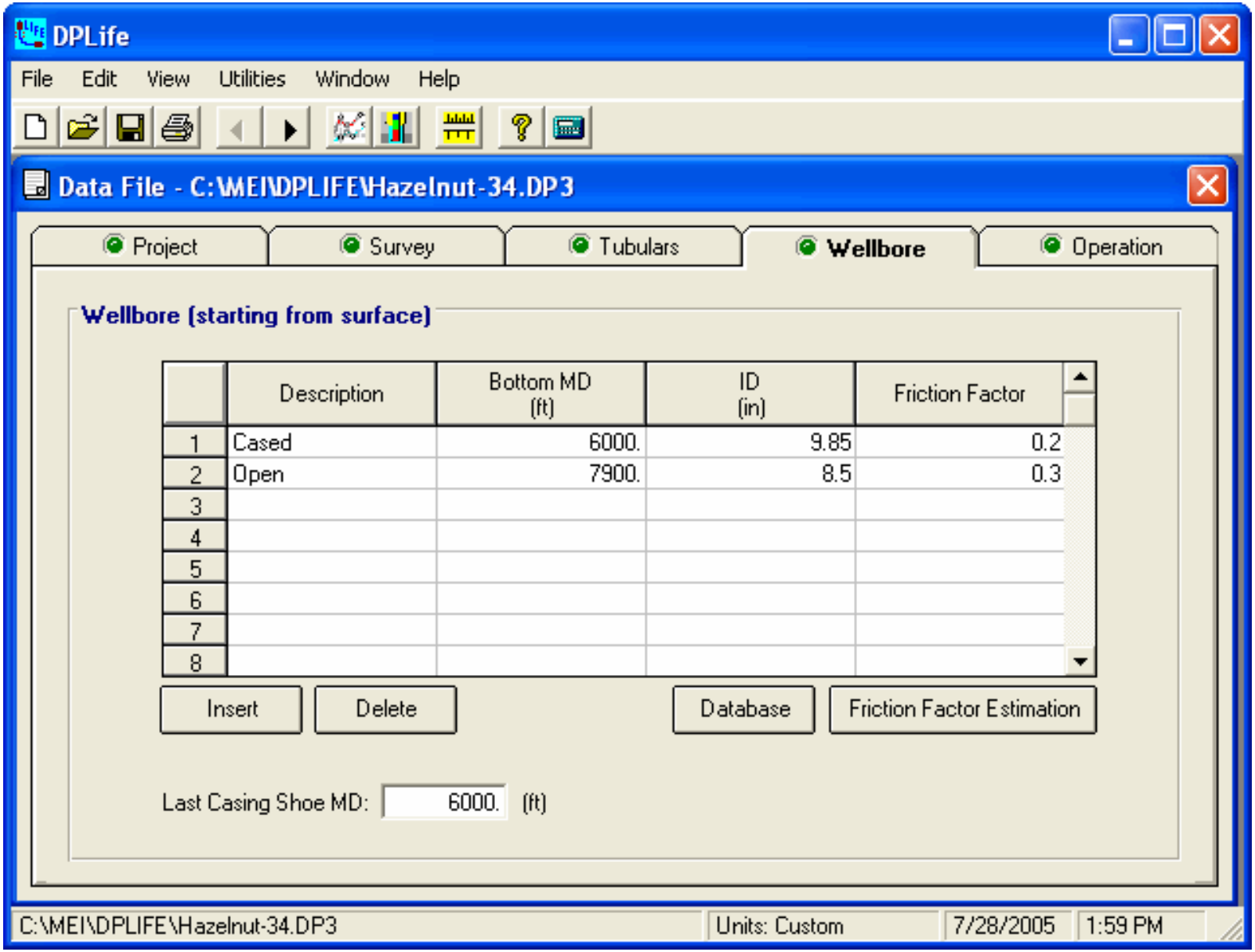

Wellbore geometry is entered on the **Wellbore** page, along with friction factors for each hole section. Open the Friction Estimator or Tubular Database for help with these parameters.

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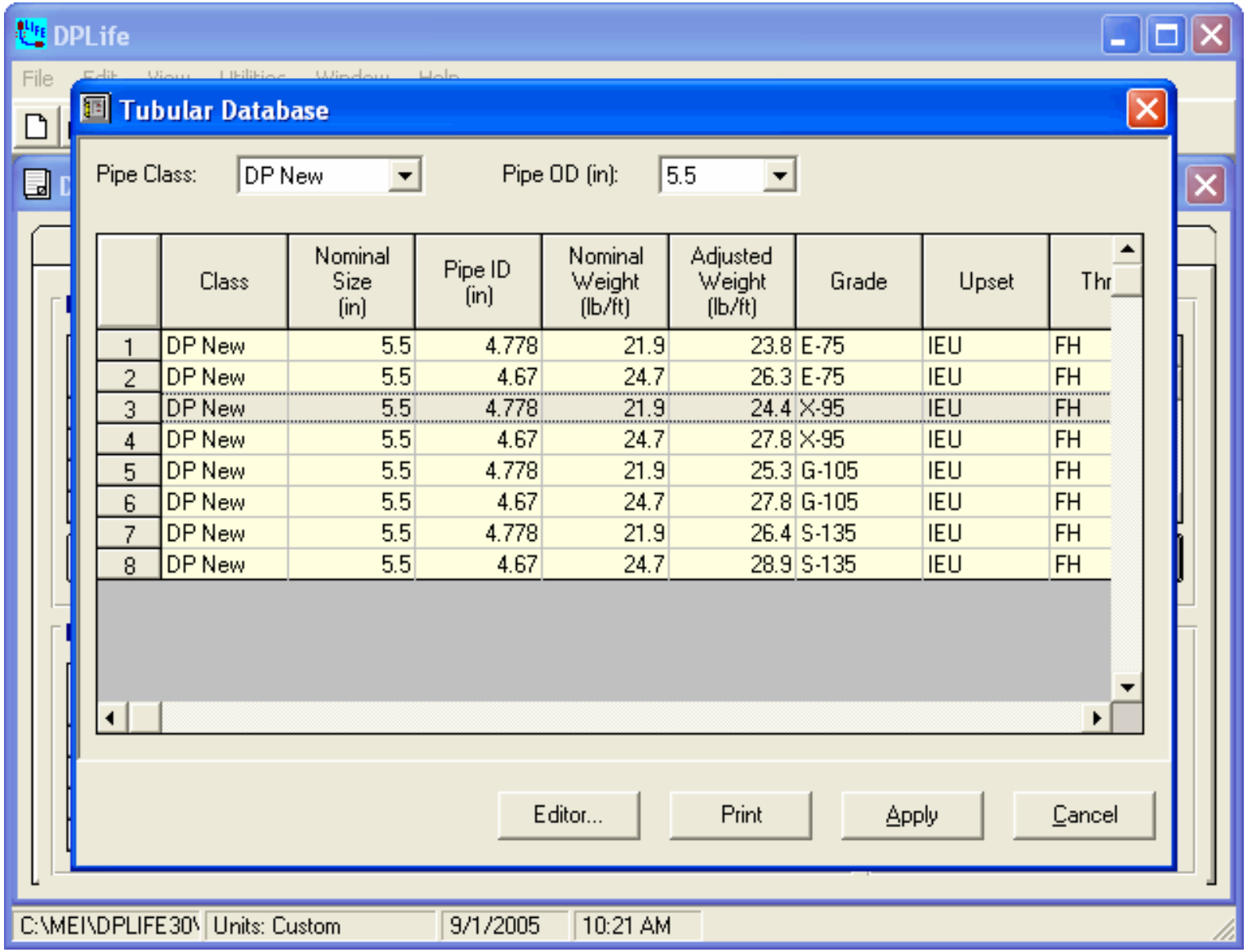

All Maurer Technology programs include an extensive database of tubulars that may be edited/customized. This feature avoids the need to look up the drillstring component's size, weight, ID, etc. each time.

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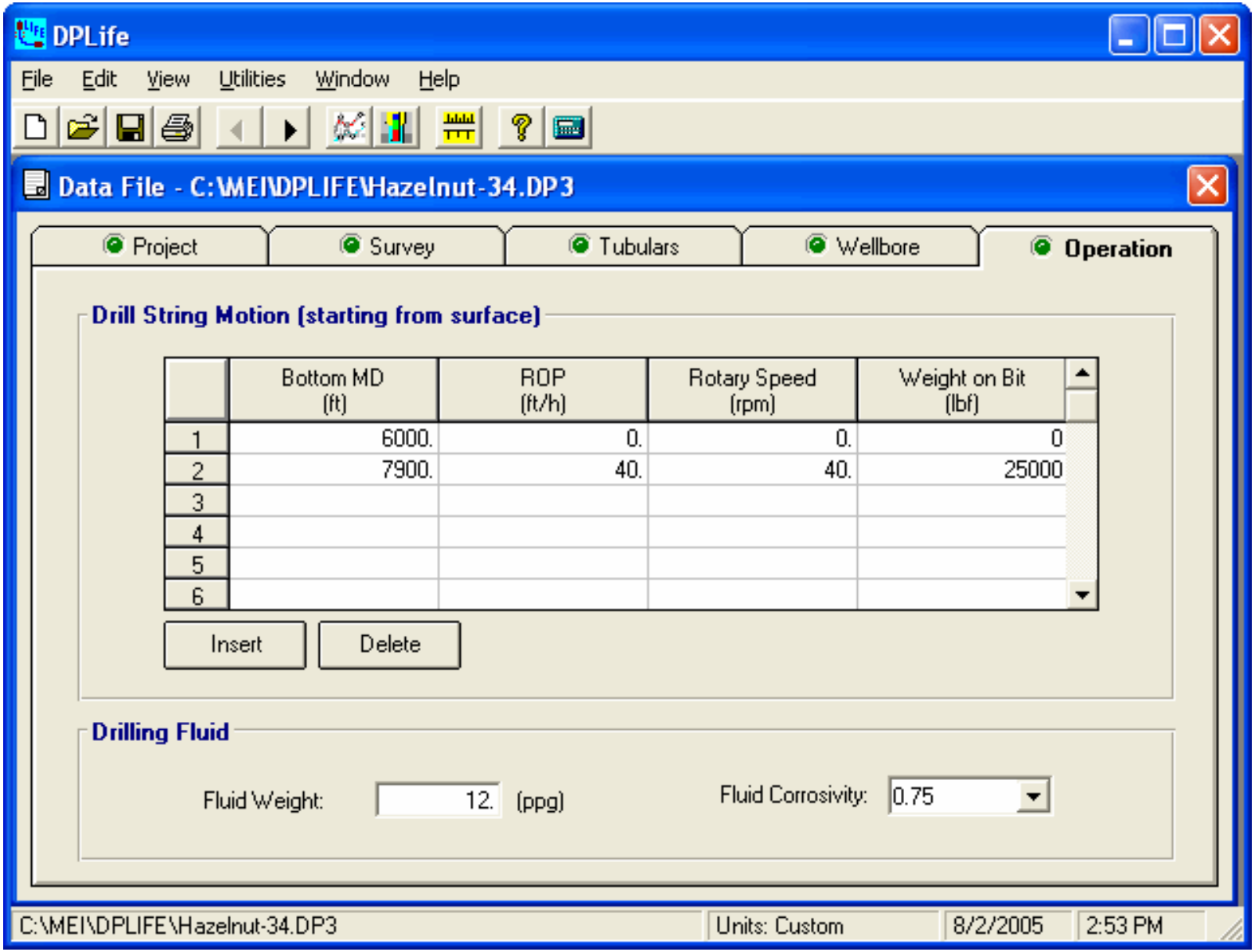

The individual steps in the field operation are listed on the **Operation** page. You specify the depth of the BHA; the computer keeps track of where each section of the drill string is run.

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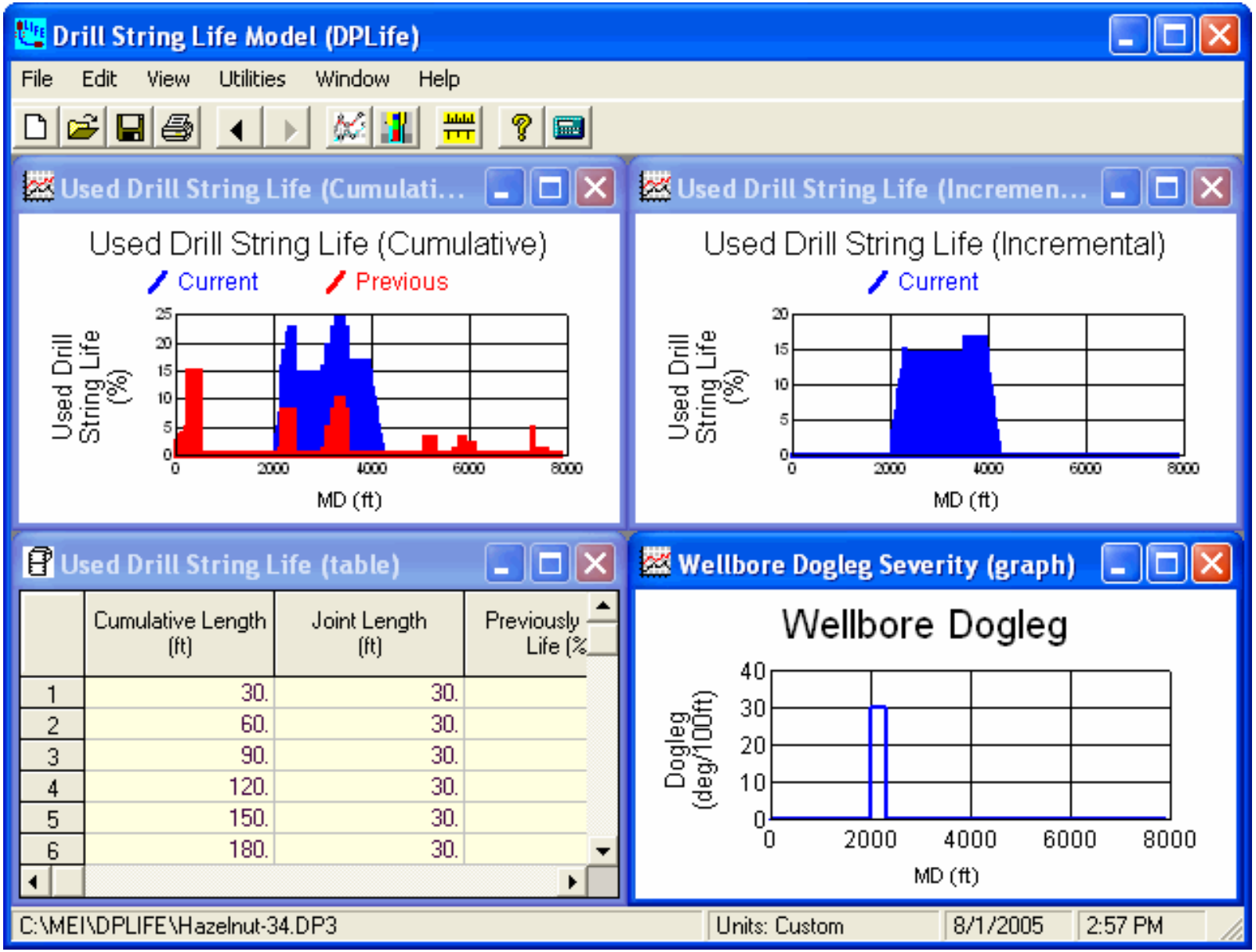

The main **Output** window shows previous and current fatigue life along the string. Data are also provided in a table display.

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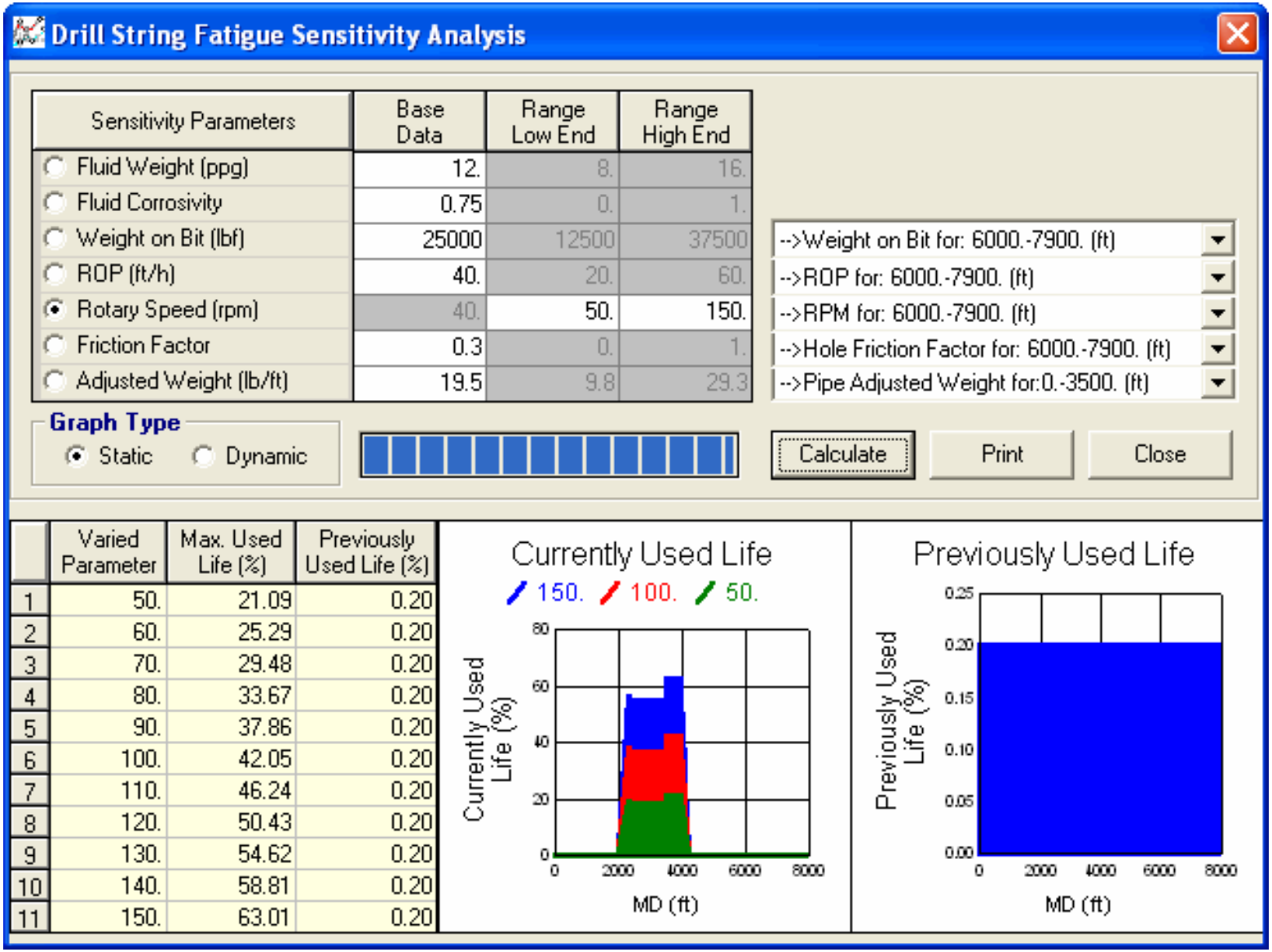

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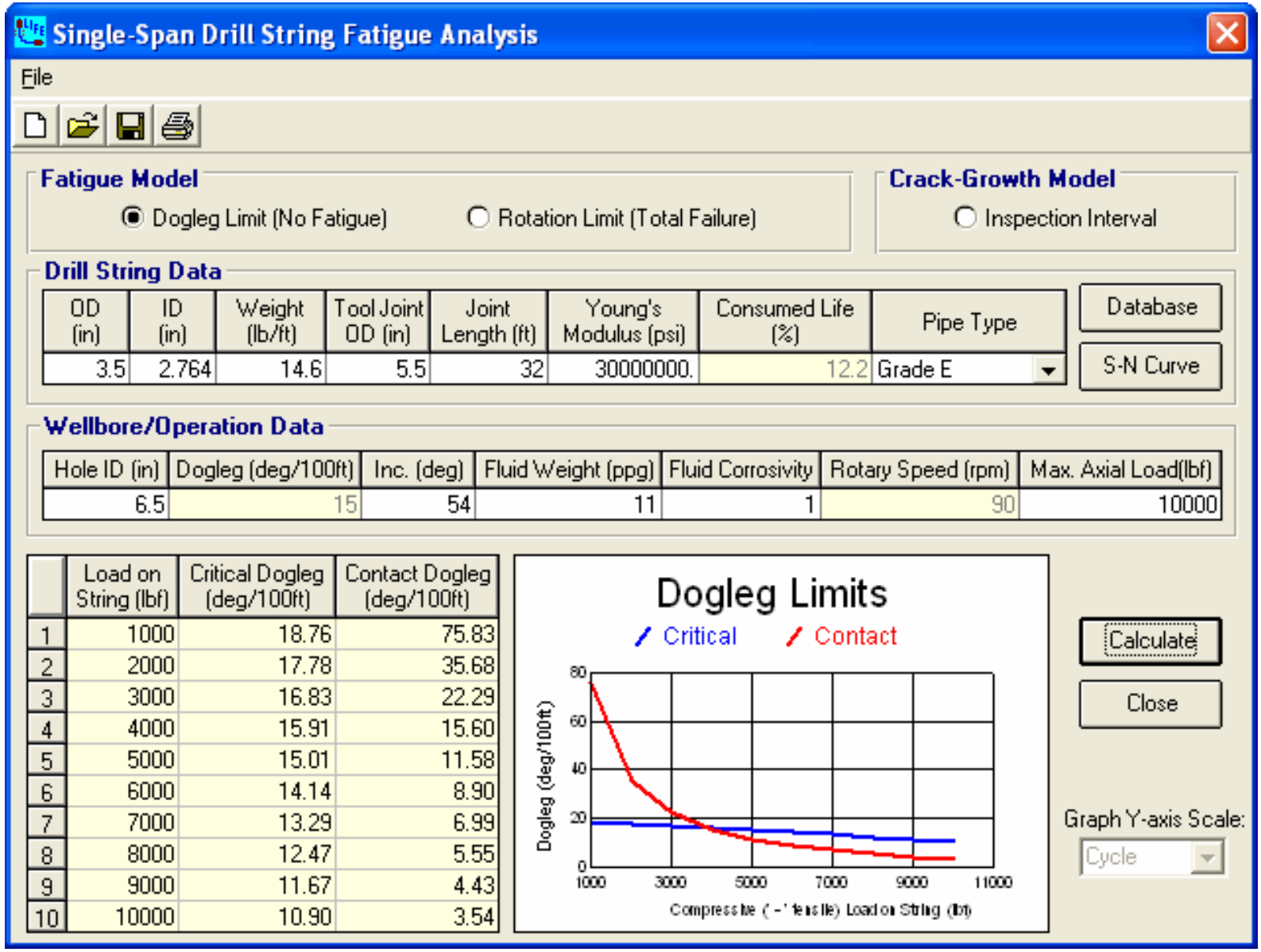
The **Sensitivity Analysis** is an important output utility. It can be used to test the impact of changes in any of several operational parameters. This type of analysis can quickly demonstrate which parameter(s) must be optimized.



General engineering analyses can be performed with the **Single-Span** utility. This considers dogleg and rotation limits for a single joint of drill pipe. A wellbore survey is not required. The Crack-Growth model can also be used to predict crack-inspection intervals for a single joint of pipe.

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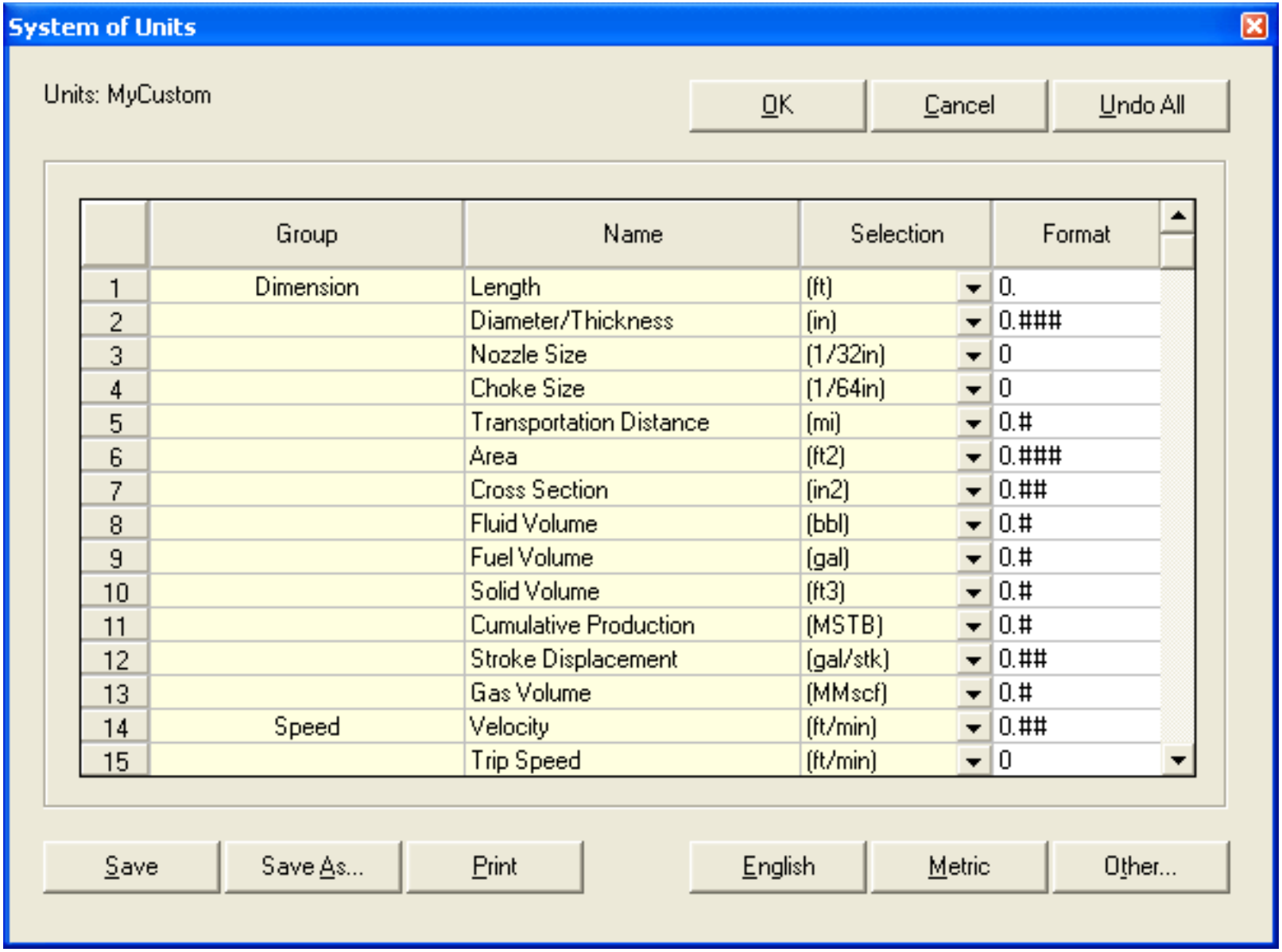

Units for input and output displays are easy to select and customize. Choose between the default metric or English systems, or a custom combination of units (for example, depth in meters, hole size in inches). Custom systems are saved and automatically recalled in future sessions.

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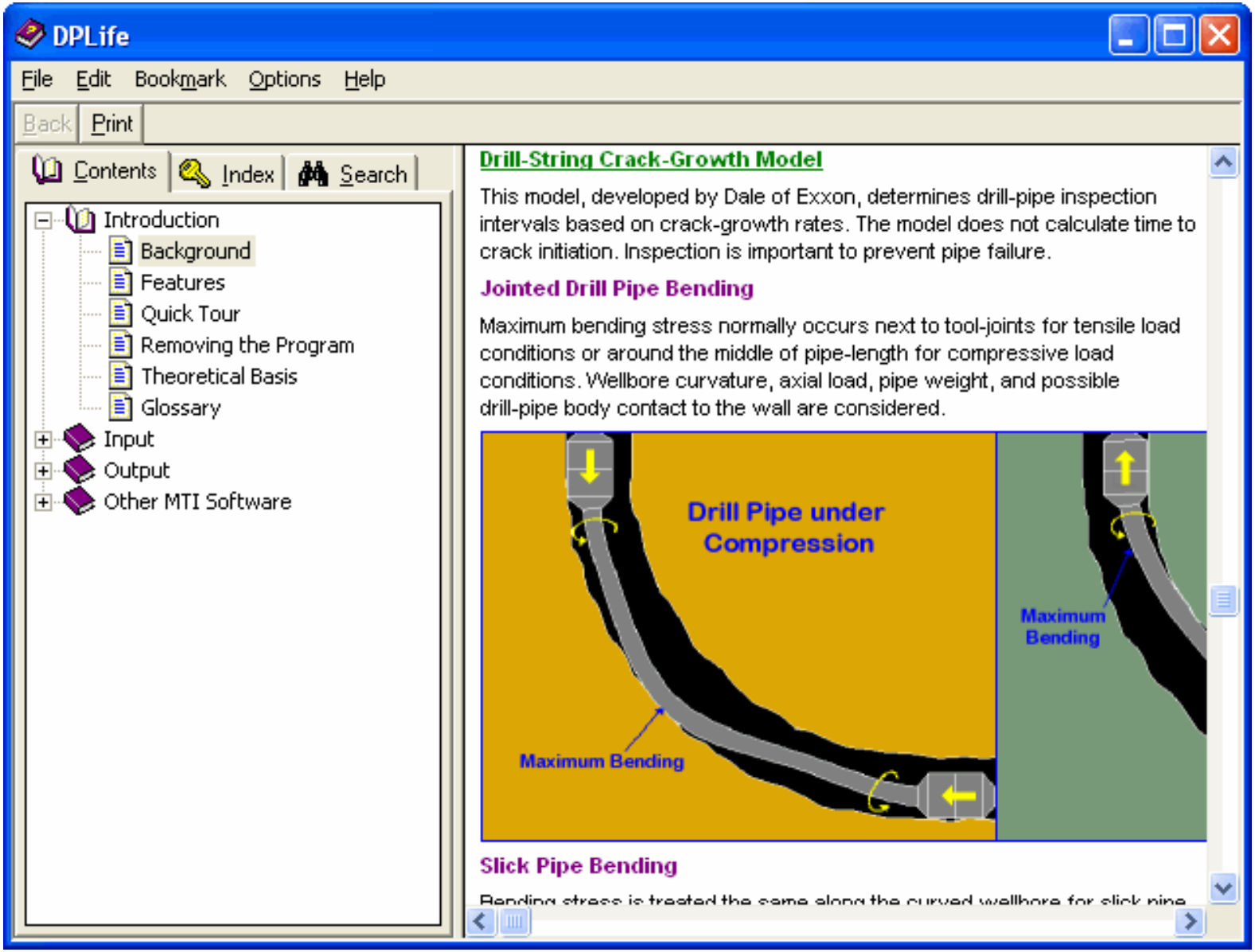

A comprehensive **On-Line Help System** is also provided. Tips on program operation, program structure, and basic theoretical background are immediately available at the click of a button.

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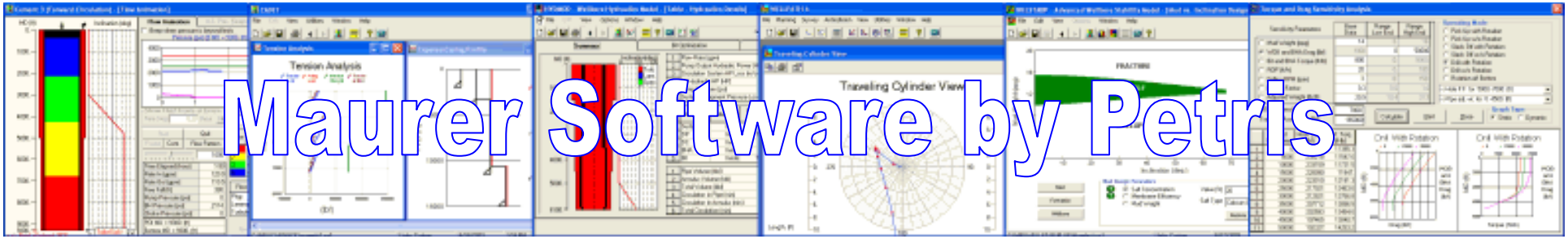

Thanks for your interest in DPLIFE

For more information on Maurer Software by Petris, email:

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or visit us on the web at

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