WELLCAT™ Software
Version 5000.1.1
Release Notes

Contents

HALLIBURTON

Introduction

This document contains important information and last minute changes related to WELLCAT™ software version 5000.1.1 that is not documented elsewhere. The WELLCAT software is an application in the Engineer's Desktop™ (EDT™) 5000.1 release, which provides major new functionality in support of the Drilling and Well Services applications on the shared EDM™ data model.

System Requirement

For details, refer to the "System Requirements" section of the *Engineer's Desktop™ Drilling Software Version 5000.1 Summary Level Release Notes*.

Third Party Applications

Landmark uses various third-party applications in the development of its software.

Landmark acknowledges that certain third party code has been bundled with, or embedded in, Landmark's software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found at the following location:

[Installdir]\Documentation\Third_Party.pdf.

Refer to the *Engineer's Desktop™ Drilling Software Version 5000.1 Summary Level Release Notes* to view a table describing a complete list of the third-party applications that are in Engineer's Desktop software Release 5000.1.

International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCNs provided in Release Notes represent Landmark Graphics' opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at mailto:FHOUEXP@halliburton.com

Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.
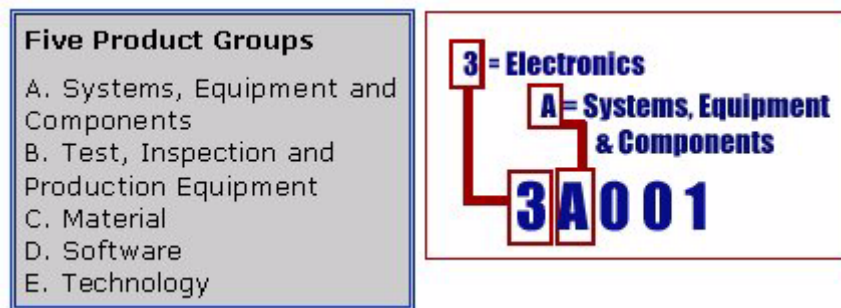
The URL is: http://www.bis.doc.gov

Definitions

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups.

The CCL is available on the EAR Website at http://www.access.gpo.gov/bis/ear/ear_data.html#ccl

Five Product Groups

A. Systems, Equipment and Components
B. Test, Inspection and Production Equipment
C. Material
D. Software
E. Technology

3 = Electronics
A = Systems, Equipment & Components
3A001

Installation

The Engineer's Desktop (EDT) 5000.1 software release must be installed prior to installing the WELLCAT software version 5000.1.1. Refer to *R5000_EDT_5000_1_1_README.txt* for specific installation instructions.

Licensing

You must have an EDM™ software license as well as licenses to the WELLCAT™ software modules and functionality you want to use.

For details on working with licenses, refer to the *Engineer's Desktop™ Software Version 5000.1 Drilling Summary Level Release Notes*.

Database Upgrade (SQL Server 2005 Express)

You must update your EDM™ 5000.1 database before you can run the 5000.1.1 version of the WELLCAT™ software.

Refer to the Installation section of these Release Notes for information on updating your database.

Enhancements and New Functionality

Enhancements and New Functionality in Version 5000.1.1

Enhanced Tubular Properties Import and Export

To simplify the process of copying tubular grades and related properties between the EDM database and WELLCAT inventories, a *wizard* has been developed. The *wizard* employs a logical set of rules when importing and exporting grades, pipes, and connections to preserve the integrity between tubular properties inventories and EDM tubular properties and to prevent mismatches.

Specifically, the logic checks for the existence of the Tubular Properties Name, Grade, Material, and Temperature Deration (when exporting Grades from inventories to EDM Tubular Properties, or importing from EDM Tubular Properties to the inventories). If the Name, Grade, Material, and/or Temperature Deration exist, the logic prevents creation of duplicates. If the Name, Grade, Material, and/or Temperature Deration do not exist, the Tubular Properties are created. If the Tubular Properties Name exists, but the Grade, Material, and/or Temperature Deration detailed properties do not match, the Import/Export Wizard opens. Refer to the online help for more information.

Additionally, WELLCAT software examines other material properties when checking grades (Young's Modulus, UTS, Poisson's Ratio). If there is a mismatch between EDM Tubular Properties and the Design's Tubular Properties Inventory, the WELLCAT software import/export operation may not occur. For example, if two or more grades are exported that use the same material, but the material properties of Young's Modulus, UTS, and/or Poisson's Ratio mismatch, the import/export operation is skipped. For additional information, refer to *Exporting and Importing Grade, Pipe, and Pipe With Connections Between WELLCAT and EDM* in the WELLCAT online help.

For a flowchart of the import and export procedure, refer to *Importing and Exporting Grades Flowcharts* on page 33.

Enhanced Integration Between the StressCheck and WELLCAT Software in the following areas:

All software included in the Engineer's Desktop Drilling Applications share data stored in the EDM Database. In addition to this shared data, the integration and data sharing between the WELLCAT and StressCheck software has been enhanced in the following areas. For additional details, please refer to the *StressCheck/WELLCAT* section in the online help Table of Contents.

- **Fluids**: The sharing of fluid density is bi-directional between the WELLCAT and StressCheck software. Therefore, a change to fluid density made by either software will be visible in the other software. When a Design created by the StressCheck software is opened using the WELLCAT software, default fluid names and rheological properties are assigned based on the fluid type (mud or cement). (Because the StressCheck

software does not support rheological properties or fluid names, this data cannot be shared between the applications.)

- **Cementing and Landing Data**: The following data is shared bi-directionally between WELLCAT and StressCheck software.

  — Mix water density
  — Lead slurry density
  — Tail slurry density
  — Tail slurry length
  — Displacement fluid density
  — Applied surface pressure
  — Float failed check box indicator
  — Pickup force
  — Slackoff force
  — Initial conditions temperature profile data

- **Design Parameters**: All design parameters are shared bi-directionally between WELLCAT and StressCheck software. The only Design Parameter Analysis Option shared between WELLCAT and StressCheck software is the *Temperature Deration* option.

- **Loads**: The following is a brief summary of load sharing between the StressCheck and WELLCAT software. For more information, refer to the *Load Integration Between WELLCAT and StressCheck*, or the *Integrated Load Data* topics in the online help.

  Sharing of load data is "one-way" only from the StressCheck software to the WELLCAT software. If a Design is created using WELLCAT software, none of the loads created using WELLCAT software are available to StressCheck software.

  If a Design is created using StressCheck software, several burst, collapse, and axial loads for casing and tubing created by StressCheck software are shared with WELLCAT software. However, any subsequent changes made to the shared loads by either application will not be reflected in the other application.

  The following loads are shared from StressCheck to the WELLCAT software:

  Burst Loads:

  — Displacement to Gas (Casing, Liner)
  — Gas Kick Profile (Casing, Liner)
  — Lost Returns with Water (Casing, Liner)
  — Surface Protection (BOP) (Casing)
  — Pressure Test (Casing, Liner, Tubing)

  Collapse Loads:

— Full/Partial Evacuation (Casing, Liner, Tubing)
— Lost Returns with Mud Drop (Casing, Liner)
— Annular Pressure Test (Tubing)

Axial Loads:

— Overpull Force (Casing, Liner, Tubing)
— Running in Hole (Casing, Liner, Tubing)
— Green Cement Pressure Test (Casing, Liner)

External Pressure Profiles:

— Mud and Cement Mix Water
— Permeable Zones
— Minimum Formation Pore Pressure
— Above/Below Prior Shoe
— Pore Pressure with Seawater Gradient
— Fluid Gradients with Pore Pressure (Although this profile is common to both WELLCAT and StressCheck software, the calculation methodology differs.)
— Mud and Cement Slurry
— Mud and Cement Mix-Water

- **Packers**: The sharing of packer data is "one-way" only - from StressCheck software to WELLCAT software, but only the first time you open the design using WELLCAT software. When using StressCheck software, packers are defined by default for tubing strings. This packer will be available to the WELLCAT software the first time a design created using StressCheck software is opened using WELLCAT software. If WELLCAT software was used to enter or edit a packer, that packer information is not available in StressCheck software.

- **Pipes, and Connections:** Tubular applications (StressCheck and WELLCAT) do not share Pipe/Connection Inventories or Tubular Properties. In order to work on the same Design with both tubular applications, always synchronize inventories using the export to catalog feature. Designs that contain pipes and connections, or partially defined pipe and connection properties with no common tubular properties, that are opened by another tubular application but do not exist in the Design's inventories and EDM database, exhibit certain conditions. Refer to *Sharing Pipes and Connections Across Tubular Applications* in the online help for more information.

- **"Save As" Complex WELLCAT Well Configurations:** To protect WELLCAT complex Well Configuration designs that include complex string type configurations, VIT (Vacuum Insulated Tubing), Dual Completions, Scab Liner, Tieback to Tieback, Tieback to Casing, Tiebacks on TLP Well Configurations, LIP (Liner Isolation Packer), and ISO Connections, StressCheck software user is limited to "Save As" these Designs. However, the user is allowed to perform modifications and "Save As" these Designs to be valid in StressCheck.

DeepWater and Steam License Check Out

License check-out for DeepWater and Steam functionality was modified. If an available license exists, it will be checked out when the license is required to perform specific functionality. In the past, a license was automatically checked out when the WELLCAT software was opened.

Improved, Default, Minimum, and Maximum Values Implemented for Casing Loads

Improved default values, as well as minimum and maximum input data ranges, were implemented for several data fields associated with four casing loads (Displacement to Gas, Gas Kick, Lost Returns with Water and Lost Return With Mud Drop) available in the Casing module.

When *WCD* files generated using previous versions of WELLCAT software are opened using WELLCAT software version 5000.1.1:

- User entered values for these loads input in the previous version will be honored.

- New default, minimum, and maximum values will be replace the previous defaults used in prior releases.

- Results may change after you recalculate using the new defaults.

Well Explorer

Note: Some of these changes may not have a direct impact on the WELLCAT software, but are listed because the WELLCAT software is included in the Engineer's Desktop Drilling Applications.

- Added Critical Dimensions (Collapse, Axial, Triaxial Longitudinal and Triaxial Hoop) to the Casings/Tubings Catalog.

- New columns added to Tubular Properties

- Grades spreadsheet - added Cost Factor

- Materials spreadsheet - added Thermal Conductivity and Specific Heat Capacity

- Well Explorer added to Real-Time View with the following special features:

    — New icons added for Log ( ) and Log Curves ( ) in the Well Explorer. Also, logs can now be opened from a right-click menu command on the Log icon in the Well Explorer.
    — Drag and Drop individual log curves onto the log viewing area
    — ASCII, LAS (Time), and LAS (Depth) log import from the Wellbore level right-click menu

- Location Tab added to Well Properties dialog, with additional information added to the Location Tab on the Site Properties dialog

- Temperature Deration, Anistropic Radial Yield, and Anistropic Hoop Yield moved from Material Properties to Grade Properties

- XML import/exports enhanced to not carryover unnecessary tubular properties that are not used by corresponding assemblies

- License Expiry option now available, configured through the LAM Environment variable.

- Password Expiry option now available for EDM users, configured through the EDM Administration Utility.

- Ability to import/export WITSML 1.2.0 and 1.3.1 files via COMPASS and OpenWells. For more information, see OpenWells and COMPASS Help.

- Catalogs were added for Well Completion components, and support for these catalogs was added to OpenWells, PROFILE, WELLPLAN, and Catalog Editor.

- Added EDM Security > Users node > Sort Users right-click menu command to the EDM Administration Utility. EDM Administrators can now sort users by User Name or Full Name. For more information, see EDM Administration Utility Help.

Enhancements and New Functionality in Version 2003.21.1.0

EDM Features

Well Explorer

- Tree Hierarchy (Company to Design Level, and Instant Design)

- Virtual Folders

- Change History

- Attachment

- Copy/Paste

- Rename

- Delete

- Export

- Properties

- Expand/Collapse

- Associated Data Viewer

 —Wellpath

 —Pore Pressure

 —Fracture Gradient

 —Geothermal Gradient

 —Casing Assemblies

 —Tubing Assemblies

- Well Configuration

- Datum

- Rig Contractors

- Templates

- File

 —Open From File (wcd), or from Database

 —Save (file "wcd format" or to Database)

 —Save As

- Access to Database

 —Tubular Properties

 —Catalogs

- Unit System Editor

Other New Features

- Import from or Export to Catalogs

—For Inventories (Pipe, Grade, Proprietary Connections)

—Coiled Tubing (import from catalogs only)

- New Objective Grid Spreadsheet

Engineering Enhancements

VIT Tubing

It is now possible to define VIT tubing in the new VIT Tubing Pipe Inventory and then use the tubing in the wellbore configuration by selecting in on the Casing and Tubing Configuration Spreadsheet. To model VIT tubing in previous versions of WELLCAT, it was necessary to create a composite string with an OD equivalent to the outside diameter of the VIT tubing, ID equivalent to the inside diameter of the tubing, and weight representative of the overall VIT tubing (outer and inner pipes, plus insulation).

With this release, the definition of VIT has been streamlined. Using the VIT Tubing Pipe Inventory, the proper geometry, weight, and grade for both the inner and outer pipes, as well as the location of the connection in the VIT can be specified. In addition, the overall thermal properties (k-value) can be specified for both tubing and connection(s).

For information on VIT tubing, including analysis assumptions, calculations, and references, please refer to VIT Tubing topic in the online help.

Notes:

- VIT can be used as part of a dual tubing configuration for stress analysis in the Tube module.

- VIT Tubing Pipe Inventory - Use the VIT Tubing Inventory spreadsheet to define the available VIT tubing. The VIT tubing is created using the standard pipe and grade inventories. All VIT tubing defined in this spreadsheet can be used as part of the tubing defined in the well configuration by selecting it on the Casing and Tubing Configuration Spreadsheet. For more information, refer to the VIT Tubing Pipe Inventory topic in the online help.

- Well Schematic - VIT tubing can be displayed on the Well Schematic. To display the VIT Tubing, click the VIT box on the Well Schematic Properties Dialog.

Multiple Hanger Depths

To improve thermal modeling of subsea well configurations, up to 20 hanger depths can be modeled. Once the proper temperatures have been determined, thermal and flow analysis results are presented in tabular form in reference to each string hanger depth. Further analysis, such as

Annular Fluid Expansion Wellhead Movement can be performed. Be aware that multiple hanger depths can be specified for TLP wells, however this will result in the loss of some TLP analysis options because TLP analysis expects one common hanger depth.

Casing With Stabilization (Centralizer)

Buckling represents a string movement resulting from a combination of mechanical forces and pressure induced forces. Because centralizers placed along the string impact the string movement, the position of the string in the wellbore, and therefore the contact points between the string and the wellbore, their placement also impact buckling.

Centralizers impact the analysis in the following ways:

- The weight of the centralizer has been included in the axial force calculations and the contact force calculations.

- The effect of the "springy-ness" of bowed centralizers has been included to increase the contact force in stress calculations, as well as for tubing movement calculations.

- A minimum radial clearance is determined for centralized tubing. This radial clearance is used for buckling calculations for stabilized pipe, including buckling length change and contact force.

- Friction forces may be different for centralizers compared to bare pipe. The user can input a scaling factor (for rigid centralizers only) to modify the nominal friction value for the stabilized pipe intervals.

Centralizers can be manually entered into the Centralizer dialog, or they can be imported from the Centralizer Catalog. Use the Centralizers dialog to specify the location of the centralizers. Using the Centralizers dialog, you can define the interval containing centralizers by specifying the start and end distance from the casing shoe depth, and then specify the number of centralizers per joint. It is not necessary to specify each centralizer separately.

Using Prod Operations for Casing Custom Loads

Production operations can cause loads to the casings. It is now possible to select a Prod load to map temperatures and density/pressure profiles for a Custom Casing Load.

If You Select a Prod Operation:

- The annular fluid content for the casing being analyzed (current string) is based on entries in the Casing and Tubing Configuration Spreadsheet and Annulus Contents Spreadsheet, including any gas intervals, or un-cemented intervals.

- Cemented intervals will be assumed to be set cement, and the mix-water density will be used.

- The Annulus Fluid density will be used in un-cemented intervals.

- The internal fluid content for the casing being analyzed is based on:

  - The annular fluid content for the casing inside the casing being analyzed.

  - Cemented intervals will be assumed to be set cement, and the mix-water density will be used.

  - If there is tubing inside the casing being analyzed, the internal contents are based on the Prod load selected.

Hanger Lift Off In Wellhead Movement Analysis

WELLCAT Wellhead Movement Analysis has been enhanced to account for lock-rings, lift-off analysis, point of fixity, and load compensators. Use the Installation and Static Load Definition dialog to specify the parameters associated with these items.

Point of Fixity

This is the depth below which the selected outermost string has zero displacement, and is in full contact with the formation or cement. By default, the point of fixity is assumed to be at the mudline for drive pipe. For other internal strings selected to be the Outermost string, the point of fixity is assumed to be the top-of-cement as indicated on the Casing and Tubing Configuration Spreadsheet.

Using this option to change the point of fixity, you can quickly evaluate the effect that altering the point of fixity has on wellhead movement load and displacement analysis without recalculating the thermal loads.

Note: If you change the point of fixity, the thermal loads will still reference the original point of fixity (mudline for drive pipe, or TOC for internal strings).

If you have checked the Soil-Interaction Model box on the Calculate Multax dialog, the point of fixity is not applicable.

Lift-Off

This option performs a progressive failure analysis. In this analysis, slips with negative contact force between strings are assumed to come apart. When lock-rings are present,

a negative value for contact force + lock ring rating is used as the failure criterion (See Lock-Ring Rating). The program finds the worst case negative failure criterion and recalculates the wellbore loads assuming no contact at that point. The process continues until there are no failure points remaining.

For a comprehensive analysis, specify a lock-ring rating for each string as part of the wellhead.

If the Lock-Ring Rating box on the Installation and Static Load Definition dialog is not checked, this comparison is still performed to report conditions in which the contact forces exceed the lock-ring rating. However, progressive failure analysis will not be done unless the Lift-Off box is checked.

Lock-Ring Rating

Lock-rings are intended to help keep a slip assembly together. A lock-ring allows negative contact forces within a slip, up to the lock-ring rating limit. Thus, in the progressive failure analysis (see Lift-Off), the contact force + lock-ring rating is the criterion for failure, rather than simply the contact force. Default values for lock-ring rating are zero.

The rating corresponds to the highlighted string in the Strings list on this dialog. The lock-ring is applied between the selected string, and the next outer string. This field is only enabled when the outer-most string is not selected (highlighted) in the Strings list.

Inner String Cementing

WELLCAT has been enhanced to allow for cementing operations where a small diameter drillpipe or stringer set-up is used to convey cementing fluids within a large diameter casing. Inner string cementing allows for faster pumping times, and potentially smaller pumping displacement volumes down the inner string when compared to pumping down a large diameter casing. Inner string cementing functionality within WELLCAT is intended to predict the temperatures, pressures, and densities of flowing cement during an inner string cementing job of casing and tiebacks. This functionality is not intended to be used to model running casing, or to model inner string cementing for liners or scab liners. Refer to the Inner String Cementing help topic in the online help for more information.

ISO Service Load Safety Factor

Safety factors are now calculated for ISO connections based on the input load data. ISO connections can be imported directly into the String Sections. If the connection is selected, it is applied to the stress calculations. ISO safety factors are reported when the ISO safety factors are less than the corresponding pipe body triaxial safety factor.

Load envelopes for the ISO connection selected in the String Sections are automatically displayed in the Design Limits plot. Other envelopes can also be displayed on the Design Limits Plot for comparison. See the Design Limits Plot, or ISO Service Load Test Data Dialog help topics in the online help for more information.

Multiple Packer Setting Sequences

In addition to traditionally setting packers from the deepest to shallowest depth, packers can now be set in any order. Refer to the Packers Dialog help topic for more information.

Hydrostatically Set Packers

Hydrostatically set packers can now be used in WELLCAT. A hydrostatic set packer uses available well hydrostatic pressure to set it in place. This type of packer is deployed on casing or tubing using regular completion techniques. Once the packer has reached the intended setting depth, a pre-determined tubing or annulus surface pressure is applied to increase the hydrostatic pressure at the packer. As the hydrostatic pressure approaches the setting pressure of the packer, the setting will begin. This process is performed in an un-perforated or isolated liner without any well intervention or tubing plugging devices. Refer to the Packers Dialog help topic for more information.

Synthetic Based Fluids

Synthetic fluids can now be easily input using the WELLCAT user interface. Refer to the Synthetic Muds Tab help topic for more information.

Three main definition modes are supported, including overall fluids, user-defined, or default fluid property description. Thermal, solid contents, and rheological properties specific to the fluids can be specified depending on the fluid definition mode selected. Diesel thermal properties can be used instead of fluid thermal properties if these are not available.

The analysis returns the polynomial equation and coefficients which are used by the MultiString AFE analysis.

Tips for EDM WELLCAT Users

Now that WELLCAT is on EDM, you can take advantage of the integration between WELLCAT, and the other Engineer's Desktop (EDT) Drilling Applications based on the EDM platform. EDM is the platform for fully integrated well engineering and data analysis. EDM provides one-time data entry, a system to promote best practices, and an environment for managing and accessing operational knowledge and lessons learned.

Well Explorer

Current users of other EDT applications will notice the Well Explorer is now part of the WELLCAT user interface. The Well Explorer is used to browse, open, copy, delete, and manage the main data items in the database hierarchy, including Companies, Projects, Sites, Wells, Wellbores, Wells, Designs, Cases, Virtual Folders, Contractors, Catalogs, and Templates. Please refer to Working with Well Explorer for more information.

Creating and Saving a New Design

1. First of all, you must have a template saved to the database. Perform the following steps to save a template to the database.

    a) Use **File > Template > Open From File**. Navigate to the location of the template file you want to import, select the file, and click **Open**. Example templates are provided with the software.

    b) Use **File > Template > Save** to save the template to the database as a User Defined Template.

    c) Use **File > Close** to close the template.

2. Create a design. You can use **File > New > Instant Design** or you can create on step-by-step from company to design using **File > New > Company**, then **File > New > Project**, etc.

3. Select the module (Drill, Prod, etc.) you want to use, input data, and to calculate and analyze results as you did in the past with a wcd file. If you are creating a TLP, refer to the Creating a TLP section in this help topic.

4. Now, save the Design. You can use **File > Save > Save to Database** to save the design to the database, or use **File > Save > Save to File** to save to a wcd file. Note that the design must be open in order to save it to a wcd file.

Importing a WCT Template, and Saving it to the EDM Database

1. Open the *wct* template file using **File > Template > Open From File**.

2. Select the template using the **Import Template File** dialog that displays.

3. Save the template as a System template using **Template > Save As System Template**, or as a User-Defined template using **Template > Save As**.

4. The templates will be available for use after they are saved to the database.

Exporting and Saving Designs as WCD Files

You can export a design as a wcd file if the design is open. If the design is closed, you can export as an xml file, but not as a wcd file. Use File > Export > WCD File to export the design as a wcd file. You can also use **File > Save > Save to File** to save as a wcd file. To export as an xml file, right-click on the design in the Well Explorer, and select **Export**.

Working with WCD Files

You can open a wcd file using **File > Open > Open From File** or **File > Import > WCD File**. Both of these options function in the same way. When you open the wcd file, you can use the WELLCAT modules, and tools to perform your analysis as you have done in the past without saving to the database. Upon completion of your analysis, you can save as a wcd file (external to the database), or to the database. To save to a wcd file, use **File > Save > Save to File**. To save to the database, use **File > Save > Save to Database**.

Creating a TLP

To create a TLP design, perform the following steps.

1. Initially, create the design as a platform with the appropriate information for water depth, wellhead depth, and air gap.

2. Use the Wellbore > General dialog and change the Location field to be TLP/Hybrid.

3. Notice that the Wellbore > Offshore dialog has changed to allow input for a TLP.

WELLCAT File Structure

Now that WELLCAT is on EDM, the data file locations are different from the file locations in previous versions. Please note the following changes

Previous File or Folder Location	WELLCAT 2003.21.1 File and Folder Locations
Client Folder and Files	With the exception of example wcd and template files, all files previously located in the Client folder are now located in *Documents and Settings\Your User ID\Local Settings\Application Data\Landmark\WELLCAT.*
Server Folder and Files	This folder and files are now located in the *WELLCAT\Server* folder in the folder where you installed EDT. For default installations, this is *Landmark\EDT_xxx\WELLCAT\Server* where *xxx* is the version number of the EDT install.
Example Files	These files are by default stored in the *WELLCAT\Example Files* folder in the folder where you installed EDT. For default installations, this is *Landmark\EDT_xxx\WELLCAT\Example Files* where *xxx* is the version number of the EDT install.
Template Files	These files are by default stored in the *WELLCAT\Templates* folder in the folder where you installed EDT. For default installations, this is *Landmark\EDT_xxx\WELLCAT\Templates* where *xxx* is the version number of the EDT install.
	Now that WELLCAT is on EDT, templates must be stored in the database before they can be used to create new designs. Refer to the section titled **Creating and Saving a New Design** in these Release Notes, or to Using WELLCAT Templates in the online help for more information.
Report.rpt Library.lib	Default copies of these files that are not used are placed in the *WELLCAT\User Defaults* folder in the folder where you installed EDT. For default installations, this is Landmark\EDT_xxx\WELLCAT\User Defaults where *xxx* is the version number of the EDT install.
	The files that are used are located in *Documents and Settings\Your User ID\Local Settings\Application Data\Landmark\WELLCAT.*

Changing Data File Locations

Now that WELLCAT is on EDM, the data file locations are different from the file locations in previous versions. Use File > Data File Locations to point to the data file locations you want to use. This option is only available when you first start WELLCAT, before any files or designs have been opened.

Unit Systems

WELLCAT now uses the EDT Unit System. As a result, stress default units have been changed from ksi to psi.

Fixed Problems

Fixed Problems in Version 5000.1.1

615717 Steady-state solution differs appreciably from long term transient solution for circulation.

618639 Performance issue for Production operation including VLE.

622736 Wellhead movement pressure calculations are initiated at zero depth reference for outer-most string.

626003 Displacement to Gas load - When the current casing is followed by a liner and then by another hole section below that liner, the Influx Depth cannot be set to a depth within the second hole section situated below the liner base.

626007 Displacement to Gas load - Incorrect Pore Pressure default

626312 Displacement to Gas load - Incorrect Fracture at Shoe default

702189 Adding a new line to the Formation Properties spreadsheet produces a crash.

703462 Gas Kick load - When using scab liners, the maximum allowable Influx Depth value is incorrect.

703685 Fluids Inventory - The presence of the PVT Table Properties data is confusing because it is not used in WELLCAT.

704137 Casing Design Limit plot is not displayed in the report print preview when pagination set to one item and sorted by loads.

714938 When the hanger depth of strings are below the mudline during drilling calculations, a negative cross-section error occurs.

715047 Tubing Leak load case linked to Undisturbed maps to incorrect temperature.

716193 When more than one report document (besides the packer diagram) is added to the report, the packer diagram is not displayed in the report unless it is on the first page.

721523 Incorrect Critical Burst rating values are reported in the Rating Summary table

721555 When a slackoff force is applied after the first stage of cement, but prior to the second cement stage, the effect this force has on string buckling during the second stage cementing is ignored.

721579 Incorrect fluid distribution in a shut-in annulus following hydrocarbon production.

722092 Full Gas displacement load scenario selecting incorrect EMW and reference depth values for pore pressure and fracture gradient.

722138 Copy load functionality for Running in Hole load case does not copy the average running speed.

730802   The Mudline suspension landing data when applied from surface to subsea wellhead is not handled correctly.

731176   WELLCAT locks up when trying to access AFE Custom Loads.

733012   The In-House Connection Test Data envelope is not appearing on the Design Limits Plot.

736122   Coiled tubing input volume data is not retained after input.

737895   Gas kick pressure profile requires additional interpolation point.

742779   Calculations with Seal Movement allowed, but with nogo present and movement equal to zero, differs from calculations with no movement allowed.

745794   Incorrect Axial Load result below packer.

748657   Error occurs, and execution halts when running displacement study calculations using the Tube module.

749038   Slow execution time using Steam module.

756549   Status Bar is missing SAM, Datum Elevation, Unit System, and User icons.

766919   AFE Custom Load Report format and mapping should be done according to the new AFE custom load interface format.

766931   Incorrect temperature versus time results while circulating the same equivalent amount of time as drilling days specified with multiple tripping operations.

767655   Incorrect calculation of general fluid properties.

769731   Axial results differ depending on how the string is split into sections.

783356   External Pressure spikes back to zero at the top of cement.

788817   Incorrect default fracture gradient in a casing liner configuration for a Displacement To Gas scenario.

792453   Difference in temperature in the vicinity of mudline.

Fixed Problems in Version 2003.21.1.0

172852   Inventory window divides into several headers when using the mouse to scroll upwards.

622138   Subsea wells are not correctly handled when the wellhead is above the mudline.

634474   When using the Tube module, the Movement Summary is incorrect for Overpull load case.

719557   When using the Tube module, zero pressure values are incorrectly reported in internal/external pressure column when duplicate surveys exist.

719932   Incorrect Axial Load is displayed below packer depth in Packer Load Summary table and Packer Schematic "Tubing To Packer View".

720509   Report N/A, rather than zero, for packer forces in Overpull load cases in the Multiple Packer Loads view.

721211   Implement hanger lift off and axial load redistribution analysis. Refer to the *Engineering Enhancements* section of these Release Notes for more information.

721268   Implement stress analysis for VIT configurations.

722296   The Casing Module fails to while performing stress analysis calculations for some TLP/hybrid type configurations.

722297   Incorrect input temperature mapping for AFE custom loads leads to incorrect results for stress analysis.

721383   WELLCAT abnormally terminates during calculations when there are more than 20 tubing loads defined.

721384   When there are duplicate names in the Fluids drop-down list and the duplicate names were deleted, an invalid argument was encountered when displaying details for a properly defined shut-in load case.

721385   Incorrect internal pressures for some shut-in load cases.

721496   The Prod module should output the perforation depth for annular flow path in addition to the tubing flow path.

721549   Drill calculations exceed time warning and halt while displaying progress bar.

722127   Multax AFE custom loads for liners, in certain configurations, has incorrect final temperatures.

722128   For Casing Custom Loads, the Prod temperature results cannot be shared using the Fill Temp option.

722132   When a void at the bottom of the tieback is simulated by using the Uncemented Gap option in Cementing And Landing dialog of the Casing module, there are incorrect results for axial loads.

722134   For Lost Returns Casing loads, the pore pressure input changes when tabbing out of the Loss Zone field.

722405   MultiString does not recognize available PROD results and requires results to be recalculated.

722408   Calculation of Multistring results are not completed when the string includes VIT pipe with many tubing string sections.

722484   Multistring module was using temperatures for the wrong casing from the Prod results.

728795   Incorrect results when well is killed after production of HC/shut-in. Refer to the section titled *Modeling Kill Operations Following an HC/Shut-In Scenario* following this list of *Fixed Problems*.

728805   Incorrect buckling length reported when using the Tube module.

729269   Incorrect axial load distribution in when the expansion joint is set close to the packer.

730802   The mudline suspension landing data when applied from surface to subsea well head is not mapped correctly.

732248   Capstan effect is not calculated correctly when there are many survey points.

733854   Multistring cannot analyze continuous strings suspended at the mudline and the surface.

736144   Multistring calculations failed while defining AFE custom loads.

736611   Pressure mapping is incorrect while applying Capstan effects.

738379   When document history is turned off using Windows configurations, WELLCAT abnormally terminates when the File menu item is selected.

747574   Differences observed in results when compared to past releases due to modifications to wellhead movement calculations.

749926   Casing card error in coiled tubing operations.

755901   When using the Design Limit plot, multiple plot views are generated by scrolling the mouse wheel.

757776   WELLCAT is not able to check out more than 3 licenses simultaneously using redundant license servers.

758140   When using the Tube module, inaccurate results are displayed for annular pressure for packer loads on the Results Summary.

763527   Expansion Joint stress analysis as the same axial load distribution when compared to packer only scenario.

768073   Riser can no longer gel if there is flow in the annulus. This fix may result in different predicted temperatures when compared to previous software release where riser gel was on by default.

769713   Inaccurate discontinuity (TOC) in axial load plot

770119   Incorrect temperature profile for custom loads linked to Drill operations.

770667   For specific workflows, inaccurate contact forces reported for Wellhead Movement.

Reported MultiString Wellhead Axial Loads

Prior to this release, (1161) Wellcat Wellhead Movement Axial Forces have been calculated assuming Float failed scenario during Primary cement (landing scenario). Also the application

assumes the Datum elevation as the water surface level. Also should the Cementing and Landing dialog is not checked while building a wellhead movement analysis, the application would assume a default displacement density for Primary cementing calculations (Landing scenario) in wellhead movement calculations.

This release, has removed all these assumptions, now it honors the float status as defined in the cementing and landing dialog in casing module. I also honor the mean sea level depth and the displacement fluid as defined in the cementing and landing dialog with not need for the user to check the dialog.

Well Inclinations Greater than 90 Degrees

WELLCAT can analyze well paths with inclinations less than 90°. Some EDT drilling applications analyze well paths over 90°. If you are using WELLCAT to analyze a well path greater than 90° created with another EDM application, a copy of the well path will be reduced to 89.9° for analysis within WELLCAT. The actual well path will not be altered. If you perform additional analysis with an EDT application that does analyze well paths greater than 90°, the original well path will be used.

Modeling Kill Operations Following an HC/Shut-In Scenario

When modeling a kill operation following an HC/shut-in scenario, WELLCAT replaces the wellbore fluid (hydrocarbon column with GOR = 0 below the kill fluid) with the injected fluid when calculations are initiated. This approach can lead to inaccurate analysis if the injection time is short, or injection volume is small. To minimize inaccuracies, it is recommended the injected volume be several times the wellbore volume.

Hanger Depths

WELLCAT now honors and performs appropriate calculations of hanger depths for offshore, subsea, and TLP wells, which were not honored by earlier versions. All earlier versions extended mid-sea hangers either to the water level or to the mudline. Because of this calculation change current results can be different from results produced by earlier versions of WELLCAT depending on hanger locations and input data. This difference is expected to be noticeable near the hanger top and decrease with the depth.

Known Problems

During development of the WELLCAT™ software, issues were recorded against this version and earlier versions, but not resolved for this release. The issues listed below include functionality and issues that are planned to be resolved for future releases of the WELLCAT software. For a comprehensive list of known problems, go to:
http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp

Known Problems in Version 5000.1.1

180610   Scab liner ignored for tubing stress analysis.

619895   Casing Load Summary fails to report data at Plug Depth from Pressure Test case.

628970   Production and injection wellhead loads use the undisturbed temperature profile rather than the corresponding PROD temperatures.

701665   Buckling restriction is not correctly applied when multiple string section outside diameter sizes exist.

705217   An error occurs when calculating the displacement study in TUBE if the Running in Hole load is included.

755697   Review Well Head Movement calculations methodology when a full thermal history of drilling operations is included in Multistring Wellhead Movement calculations.

756471   Insert and Delete keys do not work on the Well Explorer nodes.

756786   Incorrect float collar depth when operation is copied.

756870   The Apply button does not work in Custom loads Fill dialog for any option (internal or external).

760285   Tubing cross section areas in packer schematic incorrect if cross-over present.

760628   Undo does not work in Centralizer spreadsheet after deleting rows from the spreadsheet or after changing a value in any field.

761603   By default, no unit system is indicated as selected by default after new install.

762475   Display may flicker when tabbing between fields on the Casing and Tubing Configuration spreadsheet.

762489   The ISO envelope is un-selected when switching between string sections.

763475   The Max DLS for MD-TVD type input in legacy files is set to NULL or blank when importing into WELLCAT EDM. It is not possible to edit or delete these rows after import.

764618   Change history is not updated to reflect changes made in WELLCAT.

767287 Refresh issue when exporting ISO connection to ISO library. User may have to re-open the ISO library to see the exported connection.

767344 Drill and Prod operations results are lost when user selects Casing/Tube connections in String Section table.

767345 In SI units, the Nozzle Size on the Drilling Operations > Drill String tab is shown as 1/32 in.

767789 File > Import > Transfer File is disabled when re-opening WELLCAT after closing when the Well Explorer is closed.

768178 Typing in prior operation drop-down in Drill Operations can cause WELLCAT software to abnormally terminate.

770070 When using the Casing or Tube modules, and a new casing or tubing load is added, it should display in the Design Limits Plot after results are calculated.

773956 WELLPLAN Cases created from WELLCAT casing designs do not display the string name in the Well Explorer Associated Data Viewer for running scenarios.

775646 VIT tubing details (OD, ID, Weight, Grade, and all other properties) should be added to the EDM database.

788070 When changing input values in AFE analysis, user needs to recalculate to update plots.

793403 Slight difference in calculated Packer to Casing Force results (during initial conditions) caused by rounding error of differential pressure in some specific datasets.

Known Problems in Version 2003.21.1.0

761318 Help > About WellCat does not display licenses in use.

761603 By default, no unit system is indicated as selected by default after new install.

761910 Import edm.xml file does not display a progress bar.

760681 Although the spreadsheet are now displayed in reports, the fonts and grid need to be adjusted.

756870 The Apply button does not work in Custom loads Fill dialog for any option (internal or external).

764171 A scrollbar pops is unnecessarily displayed in the middle of the screen when switching designs using tubing assembly.

764618 Change history is not updated to reflect changes made in WELLCAT.

767789 File > Import > Transfer File is disabled when re-opening WELLCAT after closing when the Well Explorer is closed.

756549   The Status Bar does not display SAM, Datum Elevation, Unit System, and User icons.

769845   WELLCAT should not be able to edit locked designs.

770339   Copied design on same wellbore creates a second partially defined tubing row.

763475   The Max DLS for MD-TVD type input in legacy files is set to NULL or blank when importing into WELLCAT EDM. It is not possible to edit or delete these rows after import.

768770   WELLCAT abnormally terminates when opening designs copied from a dated planned design.

762871   Undo (Ctrl-Z) fails to remove a record pasted into the last row in the Pore Pressure spreadsheet.

756471   Insert and Delete keys do not work on the Well Explorer nodes.

765324   When the well total depth in WELLCAT is deeper than the wellpath depth specified in COMPASS, WELLCAT abnormally terminates when calculating results.

769168   WCD files with file names containing more than 56 characters cannot be saved to the EDM database after importing. Workaround: Before importing the WCD file, rename it using a name containing less than 56 characters.

756511   The VLE Phase Diagram displays a message indicating the calculation failed when the compositions are not normalized.

761745   Tables do not preserve their size when the data is changed.

767277   When using Citrix, ISO libraries cannot be imported even if the extension is changed manually to the correct (*.lib) extension. Workaround: Place library files that you want to import in a shared local folder. Contact Landmark Customer Support for more information if necessary.

768610   Drill String Grade Properties fail to be created in EDM when exporting HWDP or Drill Pipe items to an EDM catalog.

768178   Typing in prior operation drop-down in Drill Operations can cause WELLCAT to abnormally terminate.

771190   When exporting Inventories to Catalogs, an incorrect message is displayed that indicates data was exported. However, duplicates are skipped.

Importing and Exporting Grades Flowcharts

The following shows a case where the Grade Name exists and Grade Properties match.

The following shows a case where the Grade Name exists but the Grade Properties do not match..
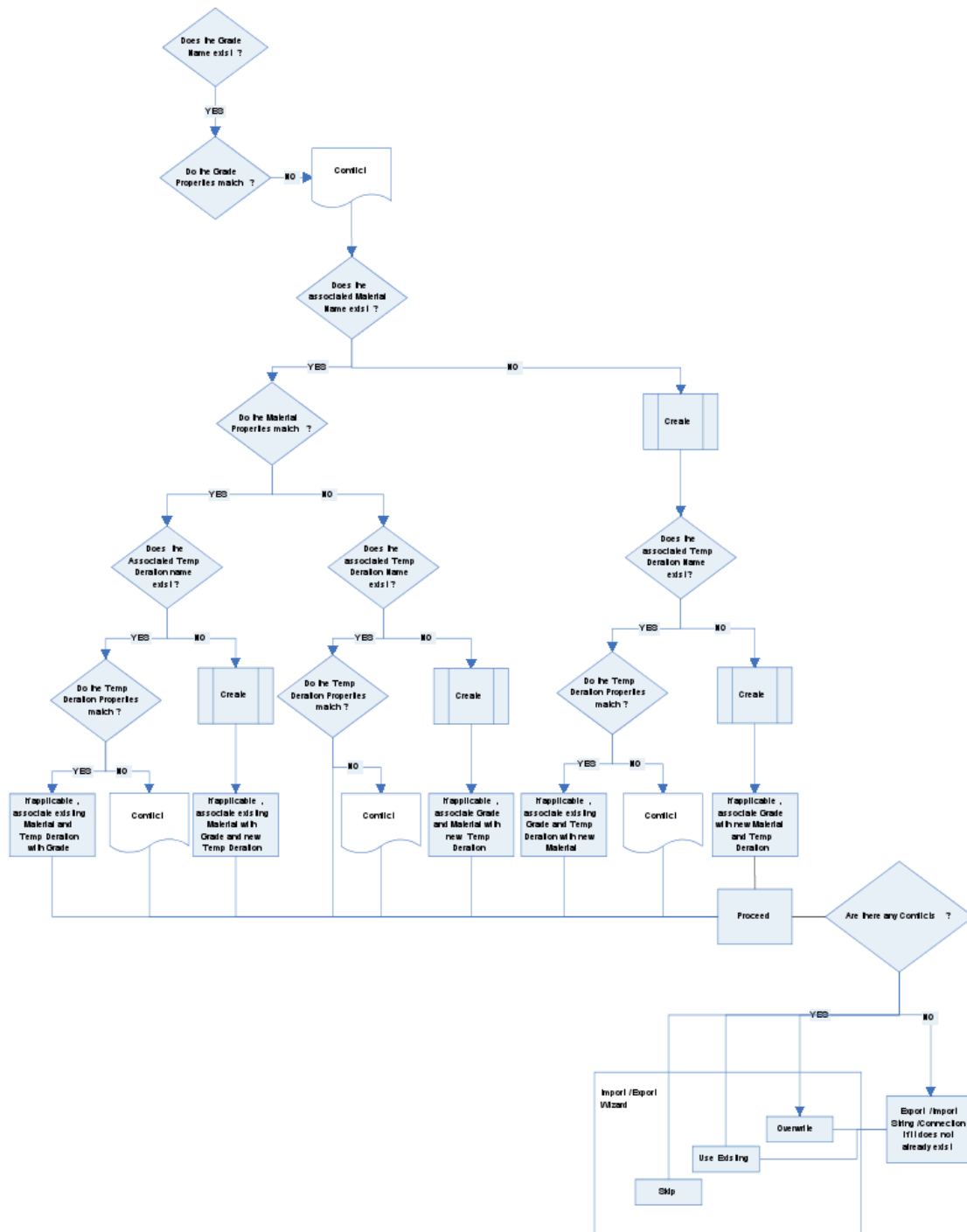
The following shows a case where the Grade Name does not exist.
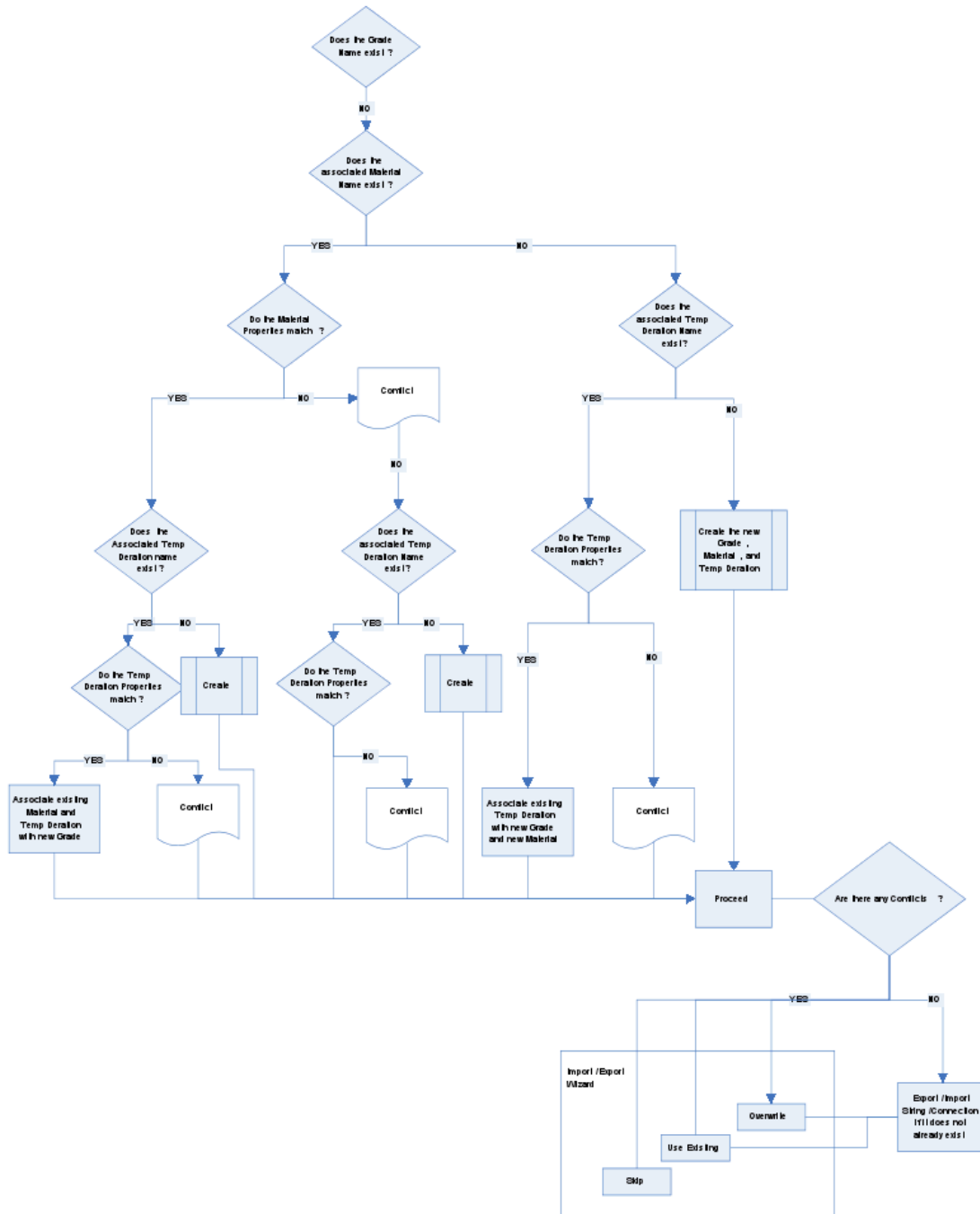
Contacting Support

Landmark operates Technical Assistance Centers (TACs) in Australia, the United Kingdom, and the United States. Additional support is also provided through local support offices around the world. Local support office information is listed below. If problems cannot be resolved at the district level, our escalation team is called to resolve your incidents quickly.

Support information is always available on the Landmark Graphics Support internet page located at: http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp.

Technical Assistance Centers

North America
7:30 am - 5:30 pm Central Standard Time
Monday - Friday, excluding holidays

713-839-2200 (Houston, TX, USA)
Toll Free 1-877-435-7542
(1-877-HELP-LGC)
Fax: 713-839-2168 (Houston, TX)
Fax: 907-275-2655 (Anchorage, AK)
Fax: 303-796-0807 (Denver, CO)
Fax: 403-262-1929 (Calgary, Canada)

Email: support@lgc.com

Latin America
(Spanish, Portuguese, English)
7:00 am - 5:00 pm Central Standard Time
Local normal business hours

1-713-839-3405 (Houston,TX,USA)
Fax: 713-839-3646
Email: soporte@lgc.com

Toll Free from:
Argentina: 0800-800-5263
Brazil: 0800-891-0837
Chile: 800-201-898
Colombia: 01800-915-4743
Mexico: 001-888-438-1296
Peru: 0800-51634
Trinidad: 1-888-438-1296
Venezuela: 0-800-526-3627

Toll Free from local area:
Ecuador (Quito) (02)226-1908

Europe, Africa, Middle East
8:00 am - 5:30 pm Local Time
Monday - Friday, excluding holidays

44-1372-868686 (Leatherhead, UK)
Fax: 44-1372-868601 (Leatherhead, UK)
Fax: 44-1224-723260 (Aberdeen, UK)
Email:
support@lgc.com

Asia, Pacific
8:00 am - 5:00 pm Local Time
Monday-Friday, excluding holidays

61-8-9481-4488 (Perth, Australia)
Toll-free 1-800-448-488
Fax: 61-8-9481-1580
Email:
apsupport@lgc.com

Toll-Free from:
China: 10-800-6100-253
Indonesia: 001-803-61284
Japan: 00531-61-0021
Malaysia   1800-803-687
New Zealand   0800-400-555
South Korea   00308-61-0046
Taiwan   0080-161-1350
Thailand   001-800-611-2784

Toll Free from local area:
Vietnam: 84-8-9191901
India: 91-11-622-1885 (c/o Samit Enterprises)

District Support Offices

Algeria (Algiers)
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Saturday - Wednesday excluding holidays

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Monday - Friday, excluding holidays

213 2137 7239
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Argentina (Buenos Aires)
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54-11-4312-8411
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Australia (Perth)
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Toll Free 1800-448-488
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Email: apsupport@lgc.com

Brazil (Rio de Janeiro)
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Local Time

55-21-3974-4000 or
Toll Free 0800-891-0837
Fax: 55-21-3974-4002
Email: soporte@lgc.com

Brunei (Bandar Seri Bagawan)
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67-3-233-5319
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Canada (Calgary)
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Toll Free 1-877-435-7542
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Fax: 713-830-2168 (Houston, TX)
Email: support@lgc.com

Chile (TAO TAC, Houston, Texas)
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Toll Free 800-201-898
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57-1-326-6710
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Ecuador (Quito)
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59-32-226-1844
Toll Free from Quito (02)226-1908
Fax: 59-32-226-2590
Email: soporte@lgc.com

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20-2-759-1717
(ask for Landmark Technical Support)
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India (New Delhi)
9:00 am - 5:30 pm Local Time
Local Business Days, excluding holidays

91-11-622-1885
(c/o Samit Enterprises)
Fax: 91-11-647-9246
Email: apsupport@lgc.com

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Monday - Friday, excluding holidays

62-21-3003-9039 or
Toll Free 001-803-61284
Fax: 62-21-3003-9088
Email: apsupport@lgc.com

Japan
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Monday - Friday, excluding holidays

Toll Free 00531-61-0021
Email: apsupport@lgc.com

Malaysia (Kuala Lumpur)
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Monday - Friday, excluding holidays

603-2164-1121 or
Toll Free 1-800-803-687
Fax: 603-2164-1135
Email: apsupport@lgc.com

Mexico (Reynosa)
8:00 am - 6:00 pm
Local Time

52-555-208-3533
52-555-208-3868
Toll Free 001-888-438-1296
Local Office Fax: 52-555-514-7646
Email: soporte@lgc.com

New Zealand (New Plymouth)
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Monday - Friday, excluding holidays

61-6-755-2318
Toll Free 0800-400-555
Fax: 64-6-755-2407
Email: apsupport@lgc.com

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234-1-461-0780
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People's Republic of China (Beijing)
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86-10-8486-4501
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10-800-810-0209
Fax: 86-10-8486-4819
Email bjsupport@lgc.com
or apsupport@lgc.com

Peru (Lima)
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Toll Free 0800-51634
Fax: 001-713-839-9646
Email: soporte@lgc.com

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7-495-960-2926
7-495-960-2927
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Email: apsupport@lgc.com

Taiwan
8:30 am - 5:30 pm Local Time
Monday-Friday, excluding holidays

Toll Free 00801-61-1350
Email: apsupport@lgc.com

Thailand (Bangkok)
8:00 am - 5:00pm Local Time
Monday - Friday, excluding holidays

66-2-278-8100
Toll Free 001-800-611-2784
Fax: 66-2-278-8199
Email: apsupport@lgc.com

Trinidad & Tobago (TAO TAC, Houston, TX)
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Toll Free: 1-888-438-1296
Fax: 1-713-839-3646
Email: soporte@lgc.com

United Arab Emirates (Dubai)
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Local Business Days, excluding holidays

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gulf_support@lgc.com
support@lgc.com

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Monday - Friday, excluding holidays

44-1372-868686 (Leatherhead)
Fax: 44-1372-868601 (Leatherhead)
Fax 44-1224-723260 (Aberdeen)
Email: support@lgc.com

United States (Anchorage)
7:30 am - 5:30 pm Central Standard Time
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Email: support@lgc.com

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Email: support@lgc.com

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Local Time

58-212-953-0774
Toll Free 0-800-526-3627
Fax: 58-212-952-3845
Email: soporte@lgc.com

Vietnam (Ho Chi Minh City)
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Landmark Graphics Customer Support Portal	http://css.lgc.com/CustomerSupport/ CustomerSupportHome.jsp
Oracle home page	http://www.oracle.com

Name	Website Address
FLEXNet Publisher (Acresso Software)	http://www.acresso.com
Microsoft SQL Server 2005 home page	http://www.microsoft.com/sql/default.asp
Adobe Acrobat Reader	http://www.adobe.com
Microsoft SQL Server 2005 Express home page	http://www.microsoft.com/sql/editions/express/default.mspx

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