

Working with Telluric Compensation

After importing stationary data logger (SDL) files and Allegro Field Computer™ survey files in PCS Axis, use the information in this section to prepare survey files and run telluric compensation. Topics in this section include those in the following list:

- *PCS Axis Telluric Compensation Workflow* (page 652)
- *PCS Axis Telluric Compensation Checklist* (page 653)
- *Using Stationary Survey Maintenance* (page 654)
- *Running Telluric Compensation* (page 673)

IMPORTANT: *Bridge Import* is an optional add-on that requires an activation key for operation. Running *Bridge Import* for the first time requires you to enter your Bridge activation key. If you are unable to locate your Bridge activation key, contact PCS Technical services for assistance at pcstechservices@aiworldwide.com. For more information, refer to *Activating Bridge Import for Operation* (page 15).

PCS Axis Telluric Compensation Workflow

The figure below identifies the process for working with telluric compensation in PCS Axis (Figure 14-1).

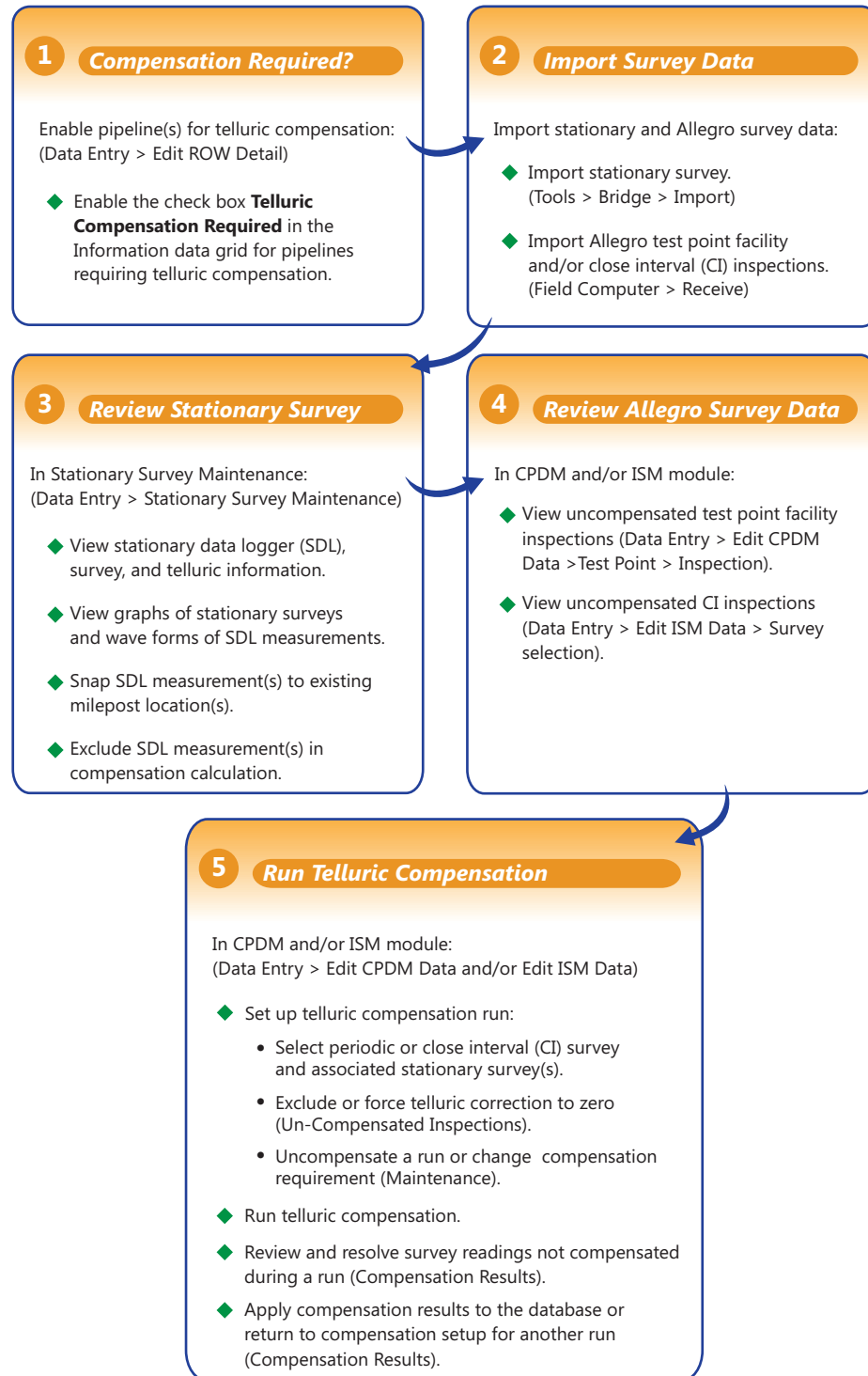


Figure 14-1. PCS Axis Telluric Compensation Workflow

PCS Axis Telluric Compensation Checklist

The following table provides a checklist of topics included in this document related to the optional Telluric Compensation feature (Table 14-1). Some topics have either been described earlier in previous sections or are included in this section.

Table 14-1. PCS Axis Telluric Compensation Checklist

To perform these tasks...	Refer to these topics...
Activate Telluric Compensation feature in PCS Axis.	See <i>Activating Telluric Compensation</i> (page 17).
View or edit default system setting for telluric threshold.	See <i>Setting Criteria Options</i> (page 40).
Add a layout theme for the <i>Information</i> data grid in <i>Edit ROW Detail</i> that includes the field labeled <i>Telluric Compensation Required</i> . Then enable this field for each pipeline segment requiring telluric compensation.	See <i>Working with Themes and Filter Groups</i> (page 167) in the section entitled <i>Working with Pipeline Records</i> (page 139).
Add a prompt theme that includes <i>Test Point Detail Inspection</i> fields to be used with the Allegro Field Computer in an annual or periodic survey.	See <i>Adding a Prompt Theme for Test Point Subfacilities</i> (page 630).
Add a Bridge Import Definition for importing stationary data logger (SDL) survey files.	See <i>Adding a Bridge Import Definition for an SDL Survey File</i> (page 503). IMPORTANT: Using Bridge Import to import data in PCS Axis requires a Bridge activation key. For more information refer to <i>Activating Bridge Import for Operation</i> (page 15).
Receive survey files from the Allegro Field Computer (close interval and/or annual/periodic survey files).	See <i>Receiving a Facility Survey from the Allegro</i> (page 613) and <i>Receiving a Continuous Survey from the Allegro</i> (page 615).
Evaluate and modify imported SDL survey files (upstream/downstream data set pairs).	See <i>Using Stationary Survey Maintenance</i> (page 654).

Table 14-1. PCS Axis Telluric Compensation Checklist (continued)

To perform these tasks...	Refer to these topics...
Evaluate and modify uncompensated test point inspections using CPDM and/or ISM.	See <i>Using Telluric Compensation in CPDM</i> (page 673) and <i>Using Telluric Compensation in ISM</i> (page 684).
Run compensation in CPDM and/or ISM for test points with telluric effects.	See <i>Using Telluric Compensation in CPDM</i> (page 673) and <i>Using Telluric Compensation in ISM</i> (page 684).

Using Stationary Survey Maintenance

Stationary Survey Maintenance allows you to determine if telluric current effects are present on a pipeline segment. After importing stationary surveys in PCS Axis, use *Stationary Survey Maintenance* to view and edit stationary survey files.

Tasks you can accomplish in *Stationary Survey Maintenance* include those described in the following topics:



- *View a Stationary Survey* (page 655)
- *Delete a Stationary Survey* (page 661)
- *View Telluric Summary Information* (page 662)
- *View a Stationary Survey Graph* (page 664)
- *View Compensation Runs* (page 666)
- *View a Survey Record Waveform* (page 667)
- *Match a Stationary Survey to an Existing Milepost Location* (page 669)
- *Exclude Survey Records in a Stationary Survey* (page 671)

NOTE: A stationary survey includes a pair of survey files provided by two stationary data loggers (SDLs). One SDL provides a survey file with upstream voltage measurements while the other SDL provides a survey file with downstream voltage measurements.

View a Stationary Survey

The *Stationary Survey Maintenance* window displays a list of imported stationary surveys and associated survey records. *Stationary Survey Maintenance* is available for use when working with either the CPDM module (*Modules > Cathodic Protection Data Manager*) or ISM module (*Modules > Indirect Survey Manager*).

To open *Stationary Survey Maintenance* and view imported stationary surveys, follow these steps:

- 1 Select the pipeline segments you want to work with in the *Select ROWs* window. Click the **Select ROWs** button  to open the *Select ROWs* window and then select one or more pipeline segments. Click  **Save** to close the window (Figure 14-2).

NOTE: A check mark inside a check box indicates a selection. To clear a selection, click the check box again to remove the check mark. A shaded check box indicates selection of some, not all, child folders, ROWs, and pipelines.

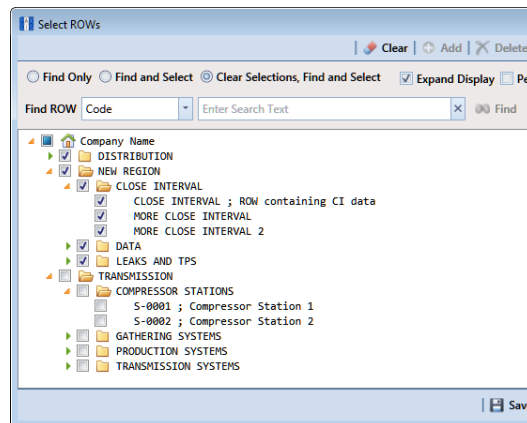






Figure 14-2. Select ROWs

- 2 Click **Data Entry > Stationary Survey Maintenance** (Figure 14-3).
- 3 If you want to filter the data view to view stationary surveys only for a particular time period, date range, or all stationary surveys, click the down arrow in the **Date range** field and select an option in the selection list. Then click **Refresh** (Figure 14-3).

NOTE: Survey records with a problem are identified with an  error or  warning icon in the survey records grid. A survey record with an error must be resolved prior to running telluric compensation. A survey record with a warning does not require resolution, however problems may occur during telluric compensation.

Conditions resulting in an  error icon include: missing ON and/or OFF voltage measurement; missing survey date and time. A  warning icon is present when the same voltage measurement is used for both the ON and OFF reading. See the next figure for an example (Figure 14-3).

For a description of the *Stationary Survey Maintenance* window, see Table 14-2, page 657.

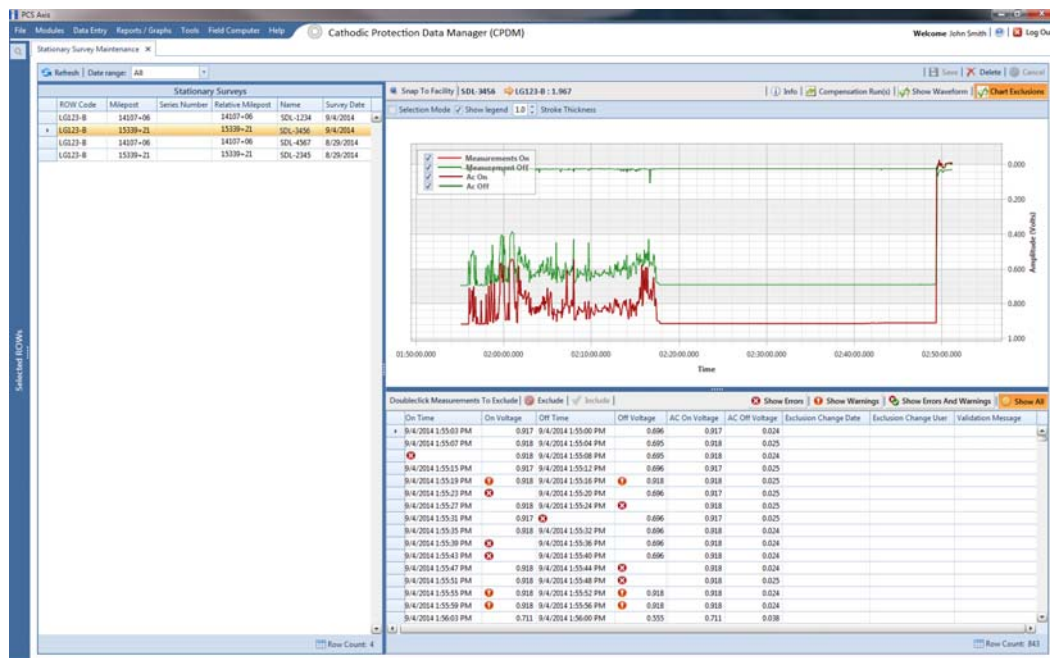


Figure 14-3. Stationary Survey Maintenance

Table 14-2. Description of Stationary Survey Maintenance Window




Item	Description
Stationary Surveys	<p>A list of stationary surveys for the pipeline segment(s) currently selected in the <i>Select ROWs</i> window display in the <i>Stationary Surveys</i> grid located on the left side of the window.</p> <p>When you want to view stationary surveys for a particular time period, date range, or all stationary surveys, click the down arrow in the <i>Date range</i> field and select an option in the selection list. Then click <i>Refresh</i> to update data showing in the <i>Stationary Surveys</i> grid.</p> <p>Clicking the <i>Stationary Surveys</i> title bar collapses the panel allowing you to view more of the graph and survey records grid. Clicking the title bar again expands the panel.</p>
Button/Information Bar	<p>Located above the graph is a button/information bar with the following features:</p> <ul style="list-style-type: none">  Snap To Facility: If the currently selected stationary survey includes milepost locations that do not match milepost locations in PCS Axis, click <i>Snap To Facility</i> to open a dialog box and match the stationary survey to an existing milepost location already established in PCS Axis. Using this feature ensures accurate telluric compensation calculations. For more information, see <i>Match a Stationary Survey to an Existing Milepost Location</i> (page 669).  Stationary Survey, ROW Code, Milepost: Selecting a stationary survey displays related information above the graph. Information includes the name of the stationary survey, ROW Code (pipeline segment), and milepost (survey location).  Info: Click this button to open the <i>Stationary Telluric Info</i> window and view a telluric summary for the stationary survey currently selected in the <i>Stationary Surveys</i> grid. Use this feature to quickly determine if telluric current effects are present. For more information, see <i>View Telluric Summary Information</i> (page 662).

Table 14-2. Description of Stationary Survey Maintenance Window (continued)




Item	Description
	<p> Compensation Run(s): Click this button to open the <i>Compensation Runs</i> dialog box. Use the dialog box to view information about a telluric compensation run for the currently selected stationary survey. Or if required, un-compensate or reverse (undo) a compensation run.</p> <p> Show Waveform: This button is available for use when the currently selected stationary survey includes one or more survey records with a waveform. Click the button to open the <i>Waveform</i> window and view a survey record in a waveform graph. See <i>View a Survey Record Waveform</i> (page 667) for more information.</p> <p> Chart Exclusions: Click this button to show or hide excluded survey records in the graph. The default state shows excluded survey records as indicated by the highlighted button.</p>
Graph	<p>Selecting a stationary survey displays associated survey measurements in a graph. Features included with the graph include those in the following list. See <i>View a Stationary Survey Graph</i> (page 664) for more information.</p> <ul style="list-style-type: none"> • <i>Selection Mode</i>: Select this check box to hide or show the ON/OFF tooltips that display when hovering the mouse over a graph line. • <i>Show Legend</i>: Select this check box to show or hide the graph legend. • <i>Stroke Thickness</i>: Click the up/down arrows to adjust the thickness of the graph line. You can also type a value in this field to adjust the thickness. • <i>Zoom In</i>: If the <i>Selection Mode</i> check box includes a check mark, click the check box to clear the check mark. Then click and hold the mouse while dragging a selection over the graph to zoom in on the selected area of the graph.

Table 14-2. Description of Stationary Survey Maintenance Window (continued)












Item	Description
	<ul style="list-style-type: none"> • <i>Survey Record Selection:</i> Click anywhere on a graph line to highlight the corresponding survey record in the list of survey records in the bottom panel. A survey record with an  arrow and a dashed selection box denotes a survey record selection.
<p>Survey Measurement Records</p>	<p>The grid in the bottom panel of the window includes a list of all survey measurement records associated with the stationary survey currently selected in the <i>Stationary Surveys</i> panel. Features included with this grid include:</p> <p>Double-click Measurements To Exclude: Double-clicking a survey measurement record excludes it from the telluric compensation calculation. PCS Axis identifies an excluded record with a red highlight; the exclusion date; and the name of the person who excluded the record.</p> <p>Use either of the following multi-select methods to exclude several records at one time:</p> <ul style="list-style-type: none"> • Press and hold the Ctrl key on your computer keyboard while selecting each record you want to exclude. Then click  Exclude. <p>–or–</p> <ul style="list-style-type: none"> • To multi-select records in sequential order, press and hold the Shift key, click the first record and then the last record. Click  Exclude. <p> Exclude: Clicking this button excludes selected survey measurement records from the telluric compensation calculation.</p>





Table 14-2. Description of Stationary Survey Maintenance Window (continued)

Item	Description
Survey Measurement Records	<p> Include: To include one or more survey measurement records in the telluric compensation calculation that have previously been excluded, select the excluded record(s) and then click  Include.</p> <p>Filter the Data View: Click any of the following buttons to filter the data view in the survey measurement records grid:</p> <p> Show Errors: Click this button to only view records with errors.</p> <p> Show Warnings: Click this button to only view records with warnings.</p> <p> Show Errors And Warning: Click this button to view only records with errors and warnings.</p> <p> Show All: Click this button to view all records in the grid; this includes records with and without errors and warnings.</p>

Delete a Stationary Survey

You can delete a stationary survey with associated survey measurement records if it has not been used in telluric compensation. When a stationary survey has been used in telluric compensation, the  *Delete* button is disabled to prevent accidental deletion.

To delete a stationary, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry > Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window (Figure 14-3, page 656).
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select the stationary survey in the *Stationary Surveys* grid you want to delete. Then click  **Delete**.
- 5 When the *Delete Stationary Survey* message displays, click  **Yes** to delete the stationary survey or  **No** to cancel the operation (Figure 14-4).

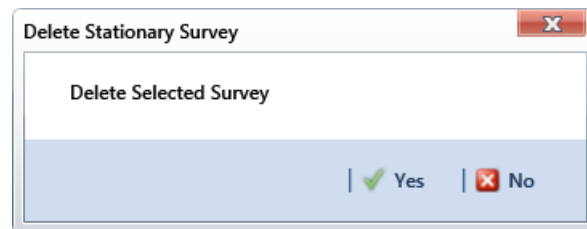




Figure 14-4. Delete Stationary Survey

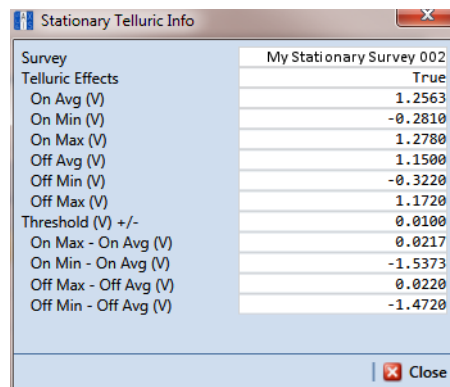
View Telluric Summary Information

A telluric summary is available for each stationary survey listed in *Stationary Survey Maintenance*. Use this feature to quickly determine if telluric current effects are present.

To view a telluric summary for a stationary survey, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry > Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window (Figure 14-3, page 656).
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select a stationary survey in the *Stationary Surveys* grid and then click  **Info** to open the *Stationary Telluric Info* window (Figure 14-5).

See Table 14-3 for a description of the *Stationary Telluric Info* window.



Stationary Telluric Info	
Survey	My Stationary Survey 002
Telluric Effects	True
On Avg (V)	1.2563
On Min (V)	-0.2810
On Max (V)	1.2780
Off Avg (V)	1.1500
Off Min (V)	-0.3220
Off Max (V)	1.1720
Threshold (V) +/-	0.0100
On Max - On Avg (V)	0.0217
On Min - On Avg (V)	-1.5373
Off Max - Off Avg (V)	0.0220
Off Min - Off Avg (V)	-1.4720

Figure 14-5. Stationary Telluric Info


The next table provides a description of the type of summary information available in the *Stationary Telluric Info* window (Table 14-3).

Table 14-3. Stationary Telluric Info

Field Name	Description
Survey	Stationary survey file name.
Telluric Effects	Identifies if the stationary survey shows telluric effects. Result for this field is either <i>True</i> or <i>False</i> .
On Avg (V)	Average ON voltage measurement.
On Min (V)	Lowest ON voltage measurement.
On Max (V)	Highest ON voltage measurement.
Off Avg (V)	Average OFF voltage measurement.
Off Min (V)	Lowest OFF voltage measurement.
Off Max (V)	Highest OFF voltage measurement.
Threshold (V) +/-	System default telluric threshold set in system Options (<i>Tools > Options > Criteria</i>).
On Max – On Avg (V)	Highest ON voltage measurement minus the average ON voltage measurement.
On Min – On Avg (V)	Lowest ON voltage measurement minus the average ON voltage measurement.
Off Max – Off Avg (V)	Highest OFF voltage measurement minus the average OFF voltage measurement.
Off Min – Off Avg (V)	Lowest OFF voltage measurement minus the average OFF voltage measurement.

View a Stationary Survey Graph

To view a graph of voltage measurements associated with a stationary survey, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry > Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window.
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select a stationary survey in the *Stationary Surveys* grid. A graph of survey measurements associated with the selected stationary survey display in the top-right panel of the window (Figure 14-3, page 656).

The stationary survey graph supports the following functions:

- *Tooltips with ON/OFF Measurements*: Placing the mouse over a point in the graph displays tooltips with corresponding ON/OFF voltage measurements (Figure 14-6).
- *Selection Mode*: Select this check box to hide or show the ON/OFF tooltips that display when hovering the mouse over a point in the graph.
- *Show Legend*: Select this check box to show or hide the graph legend. You can also click one or more check boxes in the graph legend to hide or show the selected graph element.
- *Stroke Thickness*: Click the up/down arrows to adjust the thickness of the graph line. You can also type a value in this field to adjust the thickness.

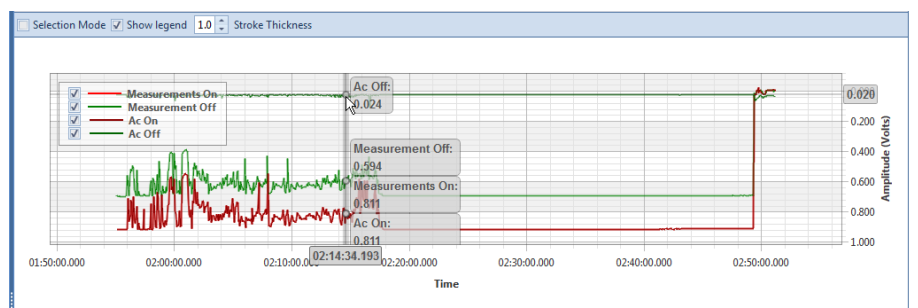


Figure 14-6. Tooltips with ON/OFF Measurements

- **Zoom In:** If the *Selection Mode* check box includes a check mark, click the check box to clear the check mark. Then click and hold the mouse while dragging a selection over the graph to zoom in on the selected area of the graph. Double-click anywhere inside the graph to return to normal graph view (Figure 14-7).

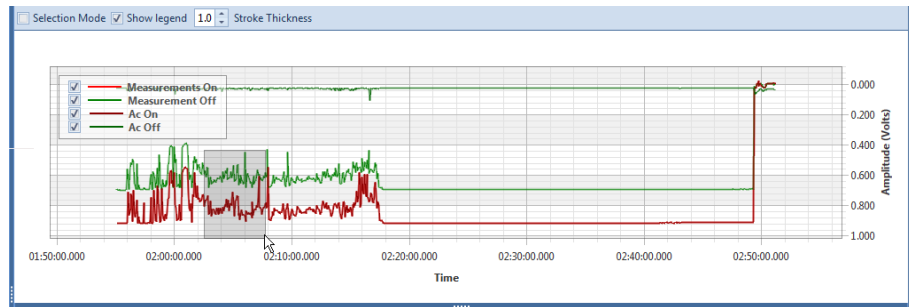


Figure 14-7. Zoom In On Graph

- **Survey Record Selection:** Click anywhere on a graph line to highlight the corresponding survey record in the survey record grid in the bottom panel. A survey record with an arrow denotes a selection in the grid. For example, the survey record with an *On Time* of 9/4/2014 2:16:11 PM is selected in the following example (Figure 14-8).

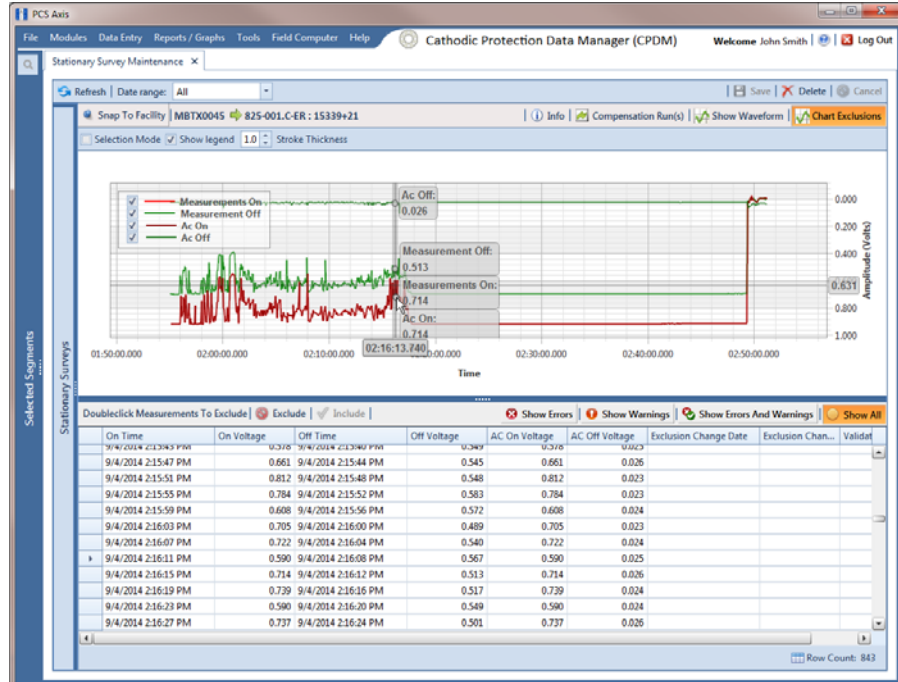





Figure 14-8. Select Survey Record in Grid

View Compensation Runs

Use the *Show Runs* link in the top grid of *Stationary Survey Maintenance* to view information about a telluric compensation run for a selected stationary survey and if required, un-compensate or reverse (undo) the compensation run.

To view information or reverse a compensation run for a selected stationary survey, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry** > **Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window.
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select a stationary survey in the *Stationary Surveys* grid and then click  **Compensation Run(s)** to open the *Compensation Runs* dialog box (Figure 14-9).
- 5 If you want to reverse (undo) the compensation run, click the check box associated with the compensation run you want to reverse. Then click  **Save** to reverse the selected compensation run.

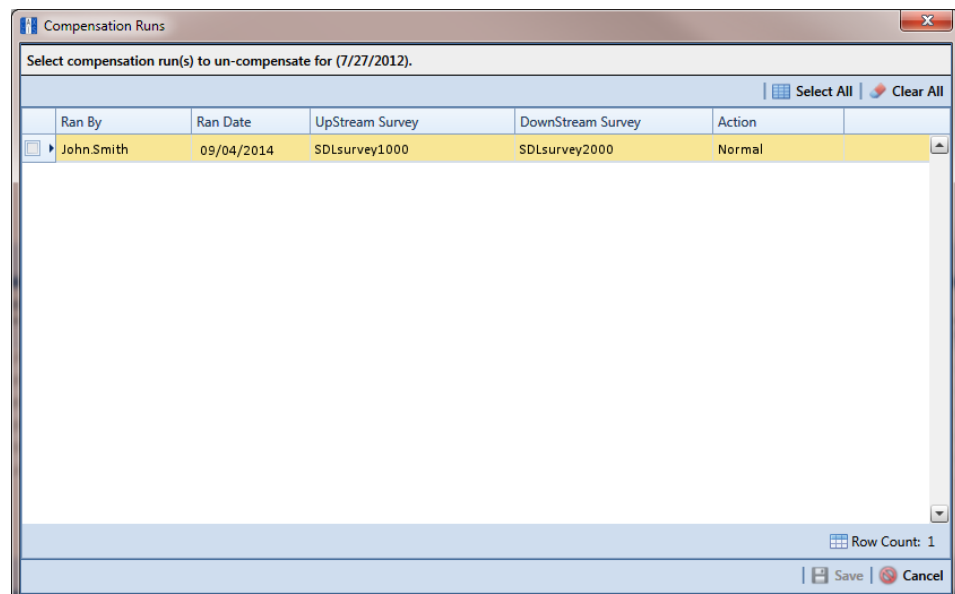





Figure 14-9. Compensation Runs

View a Survey Record Waveform

When one or more survey records in a stationary survey include an associated waveform, click the  **Show Waveform** button to open the *WaveForm* window and view survey measurements in both a graph and a grid.

To view a survey record waveform, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry > Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window.
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select a stationary survey in the *Stationary Surveys* grid and then click  **Show Waveform** to open the *Waveform* window (Figure 14-10).

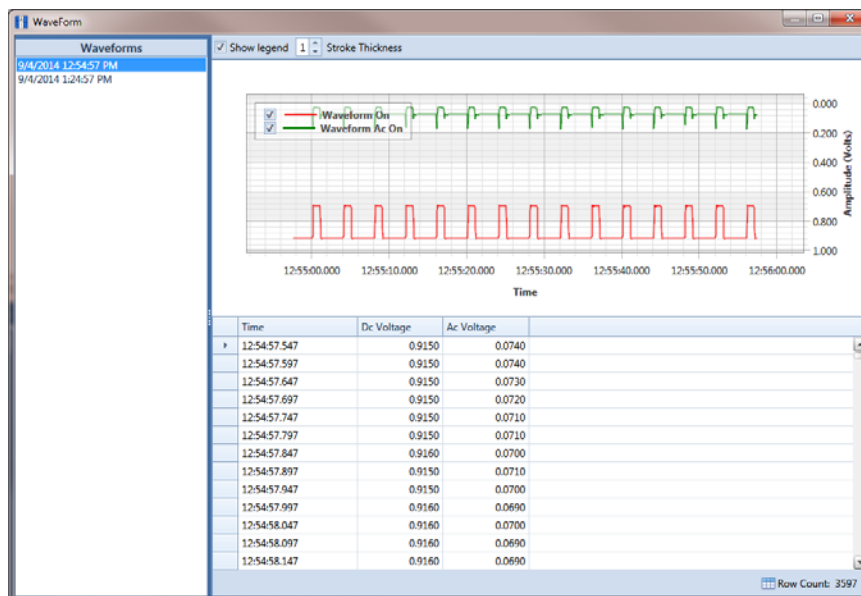


Figure 14-10. WaveForm

The waveform supports the following functions:

- *Tooltips with ON/OFF Measurements*: Placing the mouse over a point in the waveform displays tooltips with corresponding ON/OFF voltage measurements (Figure 14-11).
- *Show Legend*: Select this check box to show or hide the graph legend. You can also click one or more check boxes in the graph legend to hide or show the selected graph element.

- *Stroke Thickness*: Click the up/down arrows to adjust the thickness of the graph line. You can also type a value in this field to adjust the thickness.

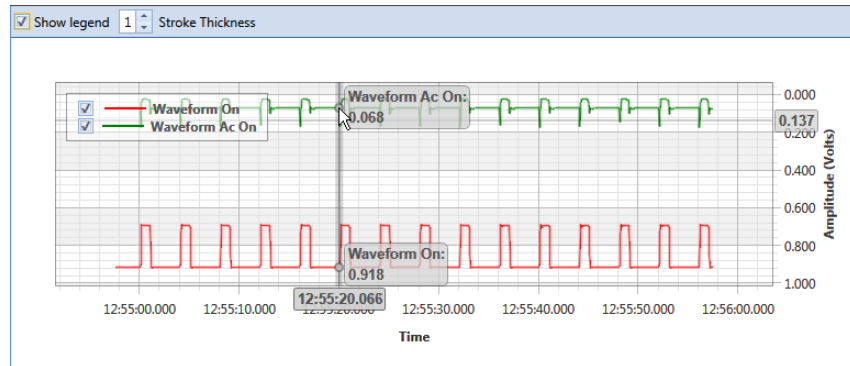


Figure 14-11. Tooltips with ON/OFF Measurements

- *Zoom In*: Click and hold the mouse while dragging a selection over the graph to zoom in on the selected area of the graph. Double-click anywhere inside the graph to return to normal graph view (Figure 14-12).

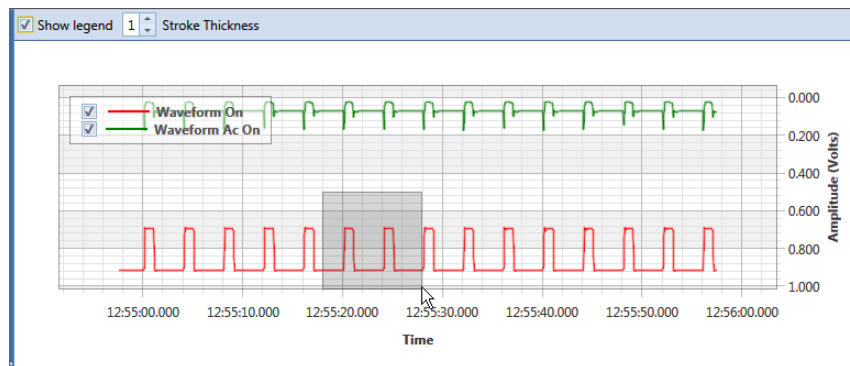




Figure 14-12. Zoom In On Graph

Match a Stationary Survey to an Existing Milepost Location

When a stationary survey includes milepost locations that do not match existing milepost locations already established in PCS Axis, these mileposts are identified as *Unregistered Milepost*. Unregistered mileposts relate only to the associated stationary survey and are not considered as facilities in PCS Axis.

To ensure telluric compensation calculations are accurate, use *Snap To Facility* to match milepost locations in a stationary survey to existing milepost locations already established in PCS Axis (Figure 14-13).

To match milepost locations in a stationary survey to existing milepost locations in PCS Axis, follow these steps:

- 1 Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2 Click **Data Entry > Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window.
- 3 Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4 Select a stationary survey in the *Stationary Surveys* grid and then click the  **Snap To Facility** button to open the *Snap To Facility* window (Figure 14-13).

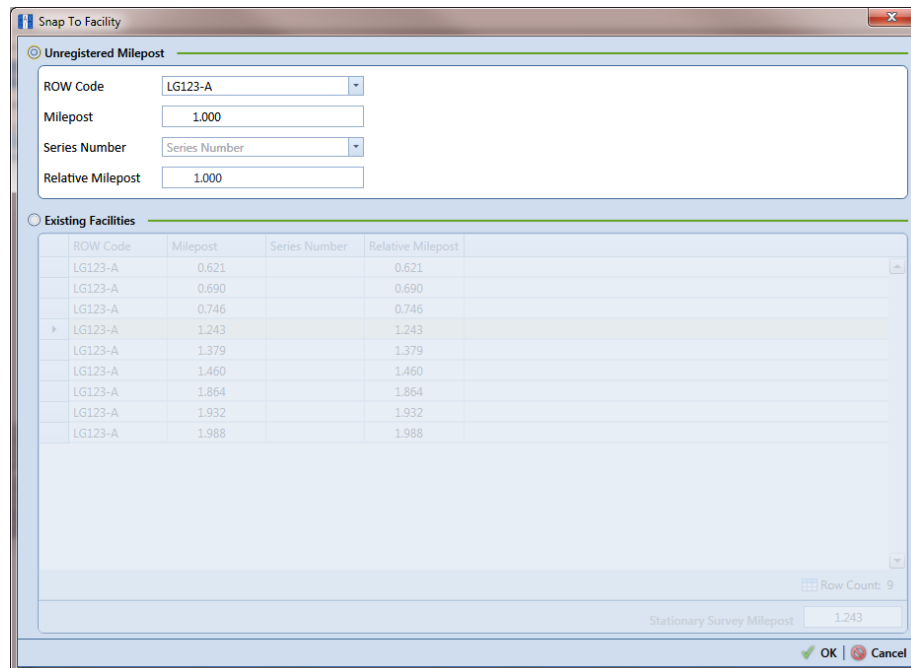




Figure 14-13. Snap To Facility

- 5 Click **Existing Facilities** to enable the grid for use.

PCS Axis automatically selects the closest existing milepost location as indicated by the highlighted record labeled *LG123-A, 1.243* shown in the following example (Figure 14-14). You can however change the selection if needed.

- 6 To snap the stationary survey to an existing milepost location, select a milepost record in the grid and then click  **OK**.
- 7 When the *Snap To Facility* window closes, click  **Save** in the *Stationary Survey Maintenance* window to save changes.

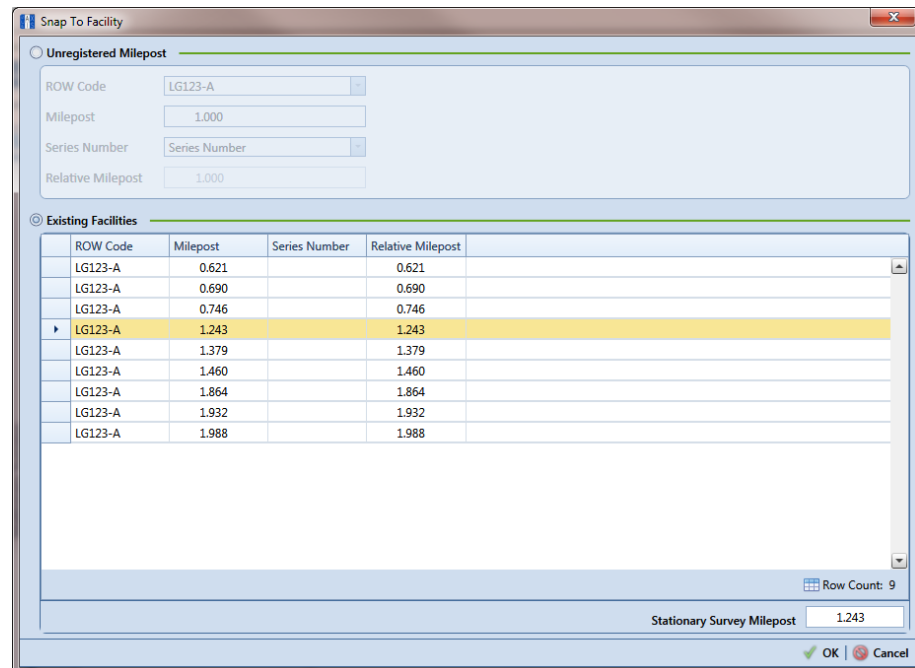




Figure 14-14. Snap To Facility





Exclude Survey Records in a Stationary Survey


When a stationary survey includes one or more survey records with problems, the survey records are identified with an  error or  warning icon. A survey record with one or more errors must be resolved prior to running telluric compensation. A survey record with a warning does not require resolution, however problems may occur during telluric compensation.

Information in this section explains how to exclude survey records in the compensation calculation. A stationary survey with any of the following characteristics that include an error or warning are eligible for exclusion:

- Missing ON and/or OFF voltage measurement.
- Missing survey date and time.
- Same voltage measurement for both the ON and OFF reading.

To exclude one or more survey records in the compensation calculation, follow these steps:

- 1** Select the pipeline segment(s) you want to work with in the *Select ROWs* window (Figure 14-2, page 655).
- 2** Click **Data Entry** > **Stationary Survey Maintenance** to open the *Stationary Survey Maintenance* window.
- 3** Click the down arrow in the **Date range** field and select an option in the selection list to filter the data view in the *Stationary Surveys* grid. Then click  **Refresh**.
- 4** Select a stationary survey in the *Stationary Surveys* grid.
- 5** If you want to filter data in the survey record grid, complete one of the following steps:
 - a** Click  **Show Errors** to only display survey records with errors.
 - b** Click  **Show Warnings** to only display survey records with warnings.
 - c** Click  **Show Errors and Warnings** to only display survey records with errors and warnings.

NOTE: Clicking  **Show All** displays all survey records related to the selected stationary survey including those with and without errors and warnings.

6 Use any of the methods in the following list to exclude one or more survey records. PCS Axis highlights excluded survey records in red as shown in the following example (Figure 14-15). The fields labeled *Exclusion Change User* and *Exclusion Change Date* also identify who excluded the survey record and when it was excluded.

- Double-click the survey record.
- Select a survey record and then right-click the mouse and choose **Exclude Selected** in the shortcut menu that opens.
- To select multiple survey records in consecutive order, click the first survey record, press and hold the **Shift** key, then click the last survey record. Right-click the mouse and choose **Exclude Selected** in the shortcut menu.
- To select multiple survey records in non-consecutive order, press and hold the **Ctrl** key, then click each survey record you want to exclude. Right-click the mouse and choose **Exclude Selected** in the shortcut menu.

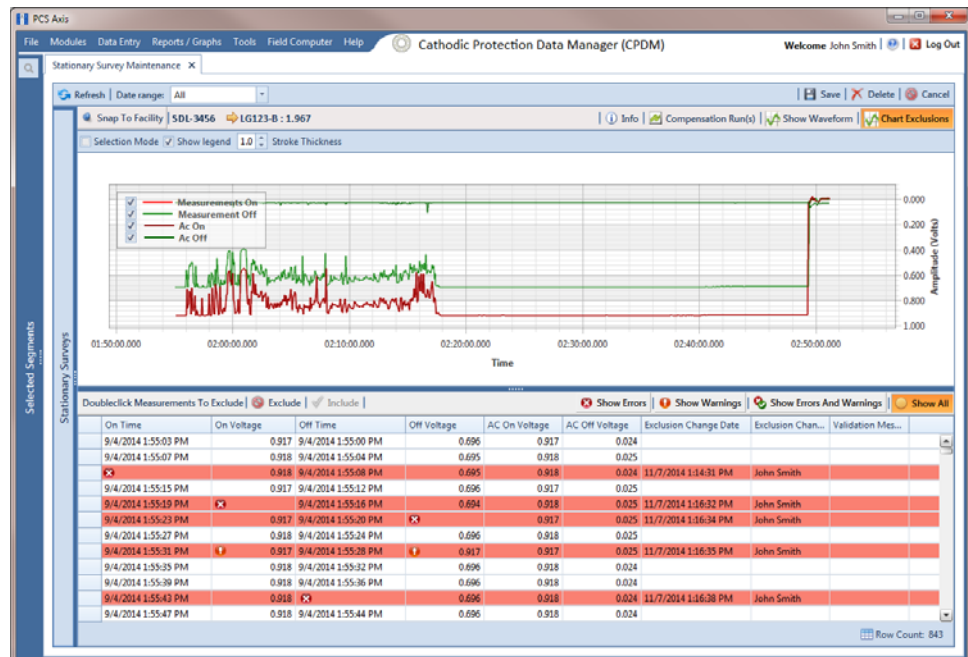


Figure 14-15. Exclude Survey Record(s) in Telluric Compensation

7 To include a survey record in telluric compensation that has previously been excluded, select the excluded survey record and then click **Include**.

NOTE: Use the **Chart Exclusions** button to show or hide excluded survey records in the graph.

Running Telluric Compensation

After receiving Allegro survey files in PCS Axis and importing, evaluating, and modifying stationary data logger (SDL) survey files in *Stationary Survey Maintenance*, use the information in this section to run telluric compensation and related functionality using features available in the CPDM and ISM modules.

Topics in this section include those in the following list:

- *Using Telluric Compensation in CPDM*
- *Using Telluric Compensation in ISM* (page 684)

Using Telluric Compensation in CPDM

When working with test point inspections in a periodic or annual survey that require telluric compensation, use the *Telluric* workspace in the CPDM *Test Point Inspection* grid to perform compensation and other related functions.


Test point records associated with the selected pipeline segment display in the *Test Point Inspection* grid and the *Test Point Inspection Detail* mini-grid. Test point inspections eligible for telluric compensation display in the *Telluric* workspace based on your selection of SDL survey files (upstream/downstream data set).

Topics in this section include those in the following list:

- *Viewing Test Point Inspections Eligible for Compensation* (page 674)
- *Changing the Compensation Requirement* (page 675)
- *Running Telluric Compensation* (page 677)
- *Reversing a Compensation Run for a Selected Survey Date* (page 681)
- *Uncompensating Test Point Inspections* (page 682)

Viewing Test Point Inspections Eligible for Compensation

Complete the following steps to view test point inspections eligible for telluric compensation in CPDM:

- 1 Select one or more pipeline segments to work with in the *Select ROWs* window. Click  **Save** to close the window (Figure 14-16).

Choose pipeline segments with the option labeled *Telluric Compensation Required* enabled in *Edit ROW Detail*. See *Adding a Pipeline Information Record* (page 150) for more information if needed.

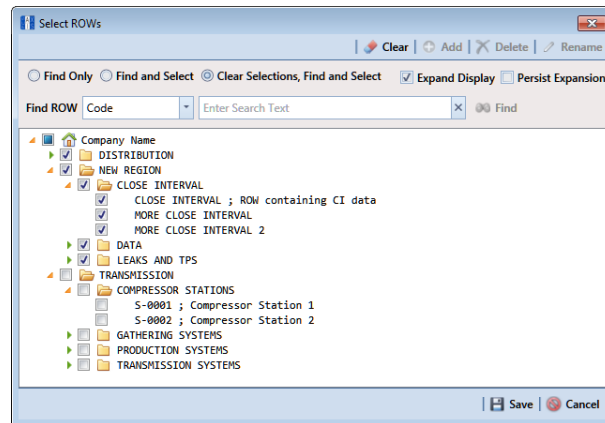
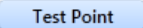



Figure 14-16. Select ROWs

- 2 Click **Data Entry > Edit CPDM Data** to open the *Edit CPDM Data* window.

- Click **Test Point**  and then the **Inspection** tab  to open the *Inspection* grid. Test points eligible for compensation include voltage measurements in the fields labeled *Uncompensated On* and *Uncompensated Off* in the *Test Point Detail Inspection* mini-grid as shown in the following figure (Figure 14-17).

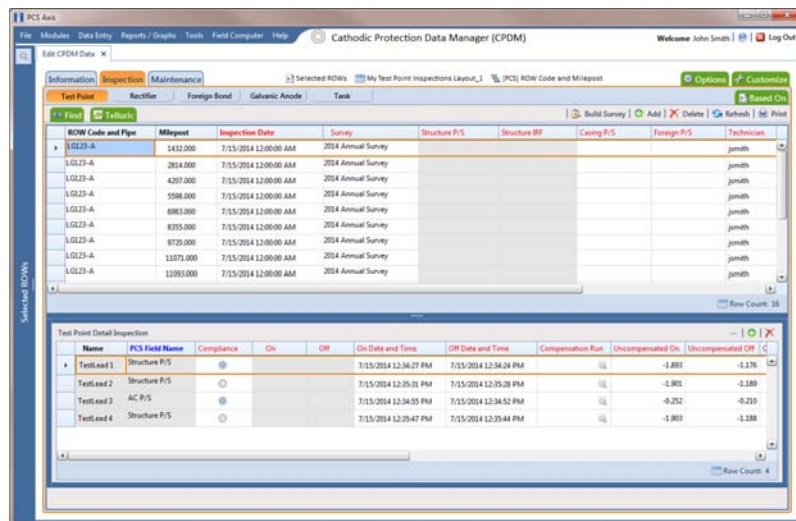



Figure 14-17. Edit CPDM Data



Changing the Compensation Requirement

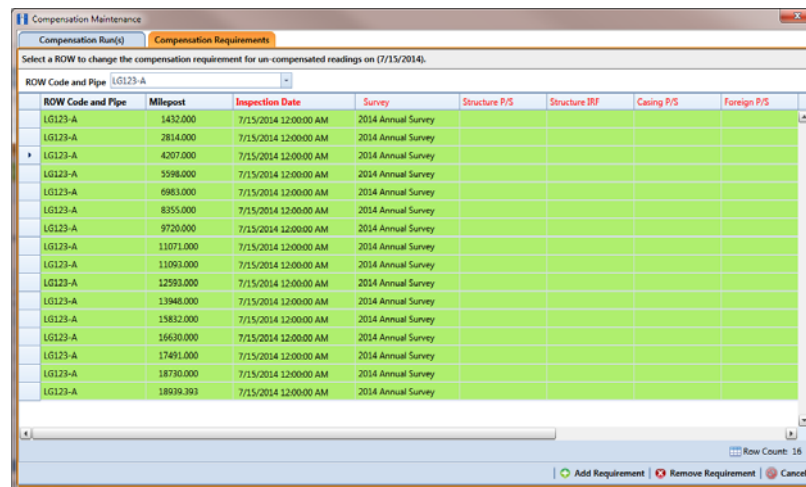
If you need to change the compensation requirement for a pipeline segment and related test point inspections, use the *Maintenance* window available in the *Telluric* workspace to apply the features labeled *Add Requirement* or *Remove Requirement* as needed.

IMPORTANT: Changing the compensation requirement must occur prior to running telluric compensation for the pipeline survey. The compensation requirement cannot be changed once telluric compensation has completed and results have been applied to the PCS Axis database.

To change the compensation requirement for a pipeline segment, follow these steps:



- Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window (Figure 14-16, page 674).
- Open the *Telluric* workspace in CPDM. Click **Data Entry > Edit CPDM Data > Test Point > Inspection > Telluric** tab.

- 3 Locate the upstream and downstream SDL survey files associated with the selected pipeline segment by clicking the down arrow in the **Survey Date** field and selecting a survey date using a calendar. You can also type a survey date in the field using the format MM/DD/YYYY to indicate the month, day, and year. Then click  **Find**.
- 4 Click  **Maintenance** to open the *Maintenance* window and then click the **Compensation Requirements** tab (Figure 14-18).
- 5 Click the down arrow in the **ROW Code and Pipe** field and select a pipeline segment in the selection list to view related test point inspections in the grid.




ROW Code and Pipe	Milepost	Inspection Date	Survey	Structure P/S	Structure IRF	Casing P/S	Foreign P/S
LG123-A	1432.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	2814.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	4207.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	5598.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	6983.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	8355.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	9720.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	11071.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	11093.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	12593.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	13948.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	15812.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	16630.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	17491.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	18730.000	7/15/2014 12:00:00 AM	2014 Annual Survey				
LG123-A	18939.393	7/15/2014 12:00:00 AM	2014 Annual Survey				

Figure 14-18. Maintenance

- 6 Complete one of the following steps:
 - a To add the compensation requirement to the selected pipeline segment, click  **Add Requirement**.
 - b To remove the compensation requirement from the selected pipeline segment, click  **Remove Requirement**.


After adding or removing the compensation requirement, PCS Axis closes the *Maintenance* window and returns to the *Telluric* workspace.

 - c If you want to close the window without changing the current compensation requirement, click  **Cancel** to return to the *Telluric* workspace.

Running Telluric Compensation

Running telluric compensation takes place in the *Telluric* workspace of the *Test Point Inspection* grid. After receiving Allegro survey files and importing and evaluating SDL survey files, use the information in this section to run telluric compensation for test point inspections in a periodic or annual survey that include telluric effects and require compensation.

Complete the following steps:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window (Figure 14-16, page 674).
- 2 Open the *Telluric* workspace in CPDM. Click **Data Entry > Edit CPDM Data > Test Point > Inspection > Telluric** tab (Figure 14-19).

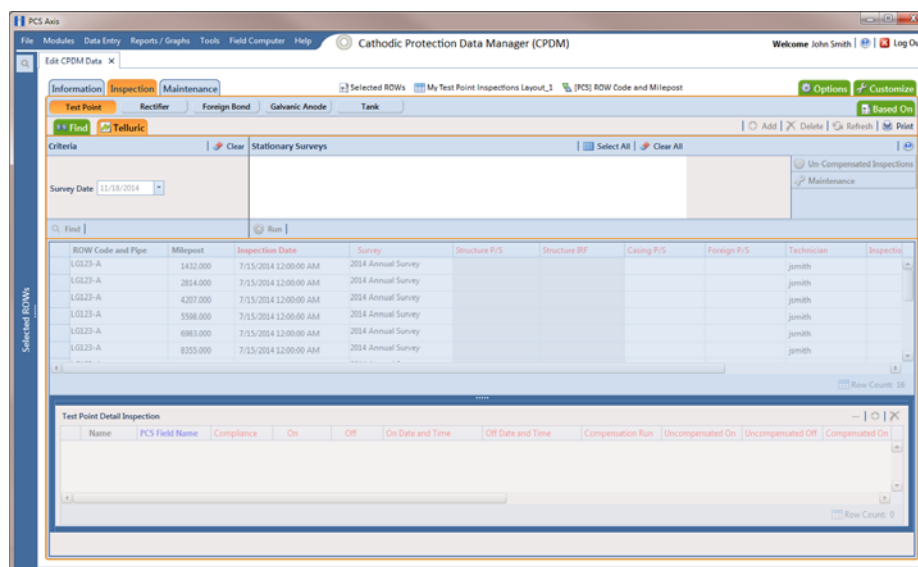



Figure 14-19. Telluric Workspace

- 3 Locate the upstream and downstream SDL survey files associated with the selected pipeline segment by clicking the down arrow in the **Survey Date** field and selecting a survey date using a calendar. You can also type a survey date in the field using the format MM/DD/YYYY to indicate the month, day, and year. Then click  **Find** (Figure 14-20).

A list of SDL survey files related to the entered survey date display in the *Stationary Surveys* group box of the *Telluric* workspace.

- 4 If you want to view a telluric summary of an SDL survey listed in the *Stationary Surveys* group box, click the **Info** link to open the *Stationary Telluric Info* window. For a description of this window, see *View Telluric Summary Information* (page 662).

- If you want to view voltage measurements associated with an SDL survey listed in the *Stationary Surveys* group box, click the **Edit** link to open the *Stationary Survey Maintenance* window. A description of this window is available in the section entitled *Using Stationary Survey Maintenance* (page 654).

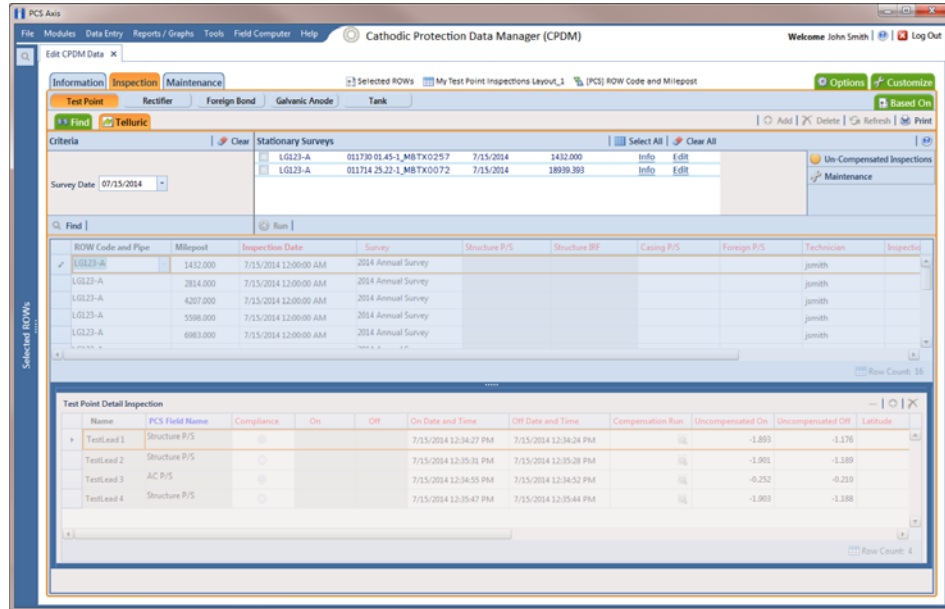


Figure 14-20. Telluric Workspace

- 6 To run telluric compensation, follow these steps:
 - a Select the SDL upstream/downstream data set pair to use in the compensation run. Click the check box associated with the upstream and downstream SDL survey files (Figure 14-21).

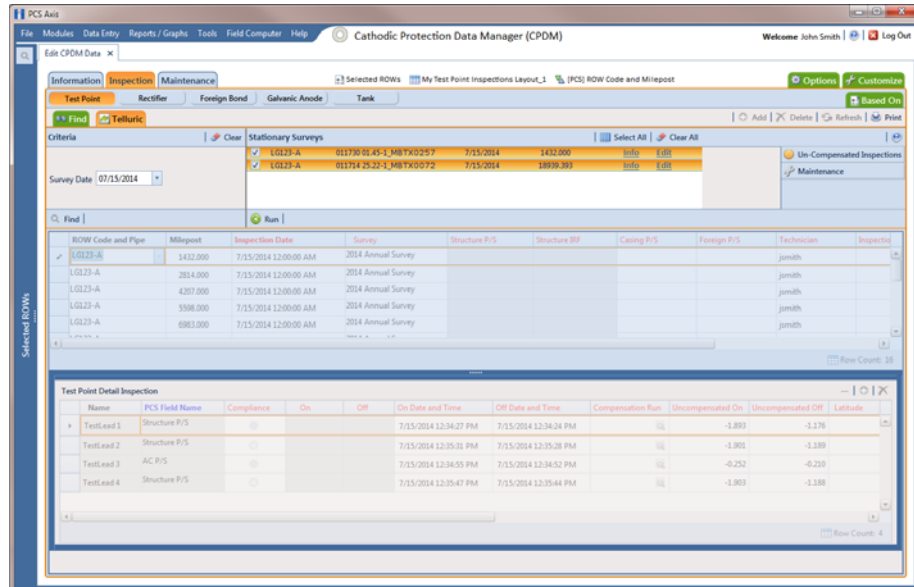



Figure 14-21. Telluric Workspace

- b Click  **Run** to begin the compensation process and open the *Compensation Results* window (Figure 14-22).

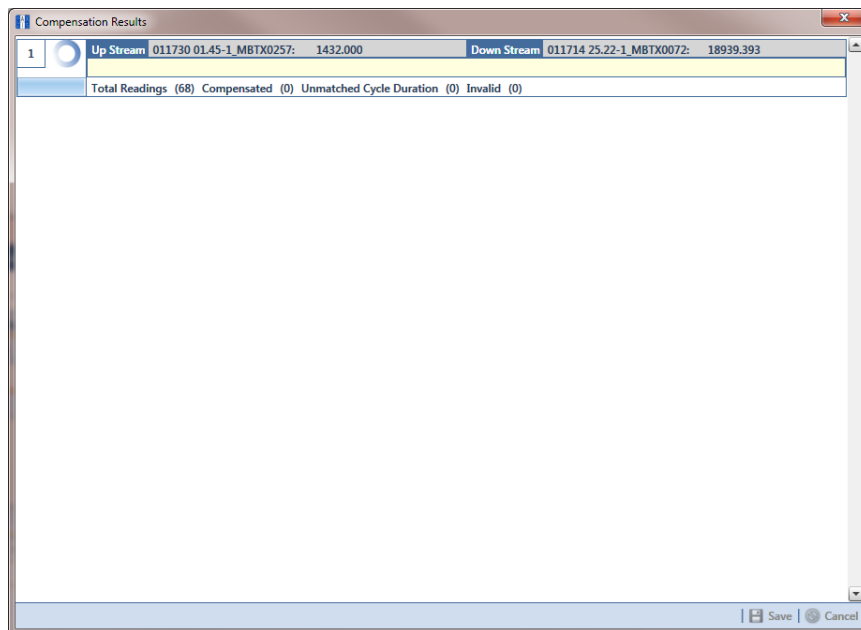



Figure 14-22. Compensation Results

- c If an error occurs during the compensation run, a  warning icon displays in the *Compensation Results* window. A description of the error and how to resolve it also display.

In the following example, the survey measurement must be changed to zero to apply no telluric correction and successfully run compensation. See *Uncompensating Test Point Inspections* (page 682) for information about how to apply *ForceZero* and *Exclude* to survey measurements.

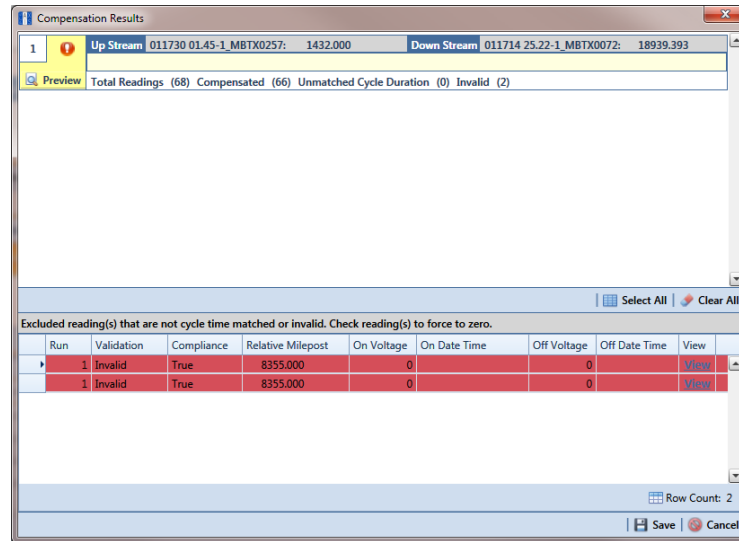



Figure 14-23. Warning in Compensation Results

- d When the compensation process completes, click  **Preview** to view a graph of compensation results (Figure 14-24).

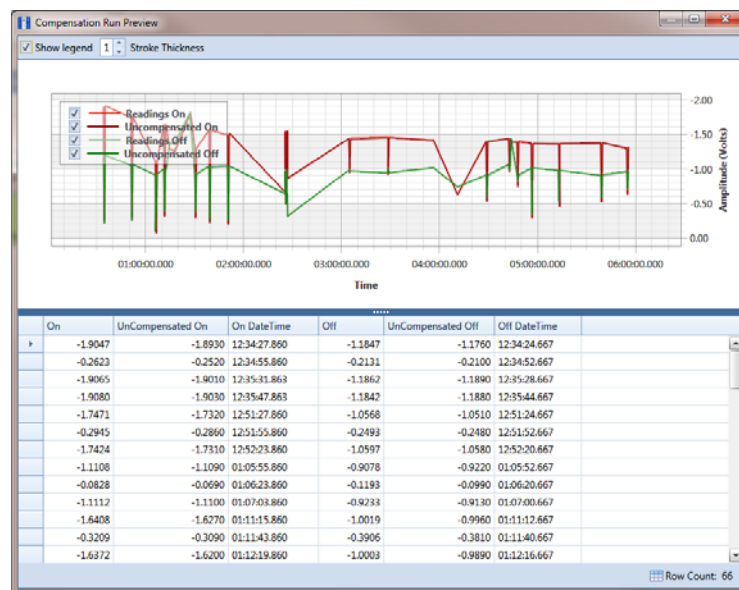





Figure 14-24. Compensation Run Preview



- e When you finish viewing the graph, click the  Windows close button to close the graph and return to the *Compensation Results* window.
- f If you want to apply compensation results to the PCS Axis database, click  **Save** in the *Compensation Results* window.

Clicking  **Cancel** cancels the compensation process. PCS Axis closes the window and returns to the *Telluric* workspace. Compensation results are also not applied to the PCS Axis database.



Reversing a Compensation Run for a Selected Survey Date

If you need to reverse (undo) one or more compensation runs for a selected survey date, use the *Maintenance* window available in the *Telluric* workspace to view a list of completed compensation runs available for uncompensation. After reversing a compensation run, the *Test Point Inspection* grid and associated *Detail* mini-grid update with uncompensated test point inspection readings for the selected pipeline segment.

Complete the following steps to reverse a compensation run for a selected survey date:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window.
- 2 Open the *Telluric* workspace in CPDM. Click **Data Entry > Edit CPDM Data > Test Point > Inspection > Telluric** tab.
- 3 Locate the upstream and downstream SDL survey files associated with the selected pipeline segment by clicking the down arrow in the **Survey Date** field and selecting a survey date using a calendar. You can also type a survey date in the field using the format MM/DD/YYYY to indicate the month, day, and year. Then click  **Find** (Figure 14-20, page 678).

A list of SDL survey files related to the entered survey date display in the *Stationary Surveys* group box of the *Telluric* workspace.

- 4 Click  **Maintenance** to open the *Maintenance* window (Figure 14-25, page 682).
- 5 If the *Compensation Run(s)* grid is not visible, click the **Compensation Run(s)** tab to view a list of compensation runs.
- 6 Click the check box associated with the compensation run you want to reverse. Then click  **Save** to reverse (undo) the selected compensation run.

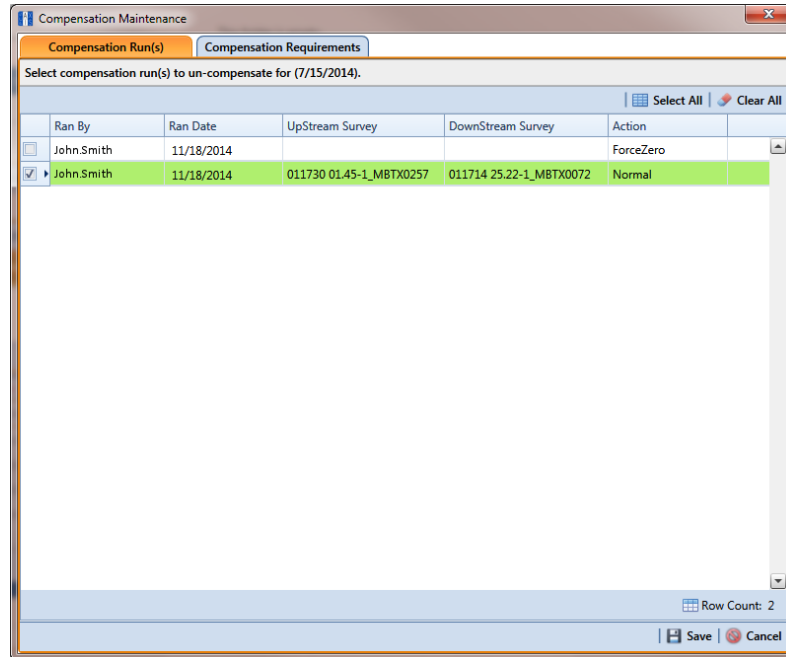



Figure 14-25. Maintenance

Uncompensating Test Point Inspections

If you want to exclude one or more test point inspections in a compensation run, or want to change the inspection reading to zero (0) for one or more test points, use the *Un-Compensated Inspections* window in the *Telluric* workspace to apply *ForceZero* or *Exclude* as needed.

ForceZero applies no telluric correction to the selected test point inspection(s). *Exclude* removes the selected test point inspection(s) from the compensation run.

Complete the following steps to uncompensate one or more test point inspections in a compensation run:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window.
- 2 Open the *Telluric* workspace in CPDM. Click **Data Entry > Edit CPDM Data > Test Point > Inspection > Telluric** tab.

- 3 Locate the upstream and downstream SDL survey files associated with the selected pipeline segment by clicking the down arrow in the **Survey Date** field and selecting a survey date using a calendar. You can also type a survey date in the field using the format MM/DD/YYYY to indicate the month, day, and year. Then click **Find** (Figure 14-20, page 678).
- 4 Click **Un-Compensated Inspections** to open the *Un-Compensated Inspections* window. Then click the down arrow in the **Action** field and select **ForceZero** or **Exclude** (Figure 14-26).
- 5 Click the check box for each test point you want to un-compensate. Click **Save** to begin the un-compensate process or **Cancel** to close the window and return to the *Telluric* workspace.

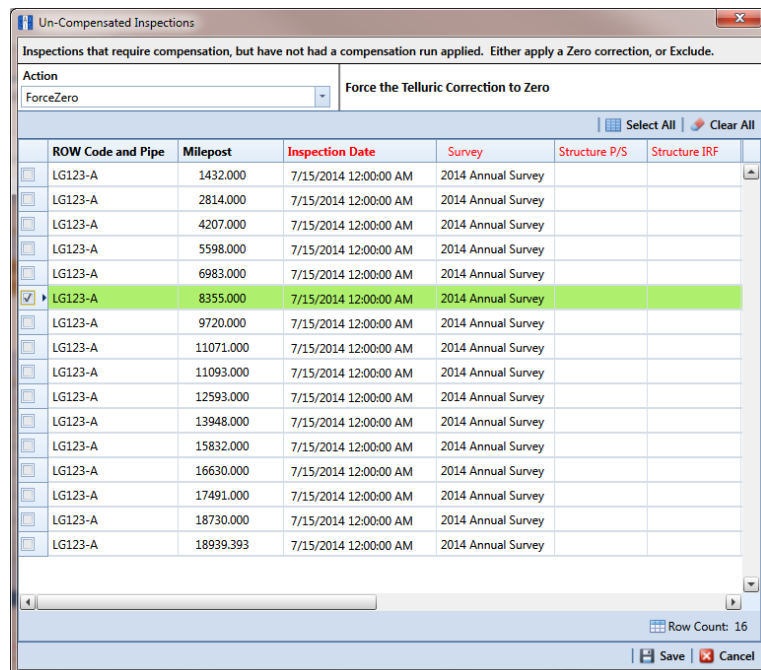


Figure 14-26. Un-Compensated Inspections

Using Telluric Compensation in ISM

When working with inspections in a close interval (CI) continuous survey that require telluric compensation, use the *Telluric* workspace in *Edit ISM Data* to perform compensation and other related functions.

After selecting a CI continuous survey to work with, inspection records associated with the selected CI survey and pipeline segment display in the data grid of *Edit ISM Data*. Inspection records eligible for telluric compensation display in the *Telluric* workspace based on your selection of SDL survey files (upstream/downstream data set) associated with the selected CI survey.


Topics in this section include those in the following list:

- *Viewing CI Inspections Eligible for Compensation* (page 685)
- *Changing the Compensation Requirement* (page 687)
- *Running Telluric Compensation* (page 689)
- *Reversing a Compensation Run in ISM* (page 693)
- *Uncompensating CI Test Point Inspections* (page 694)

NOTE: Several options are available for customizing a grid layout and sorting order, as well as applying data filters that allow you to work with a subset of CI inspection records. For information about how to apply data filters, refer to *Viewing Records in a Grid* (page 249). See *Working with Themes and Filter Groups* (page 316) for information about customizing the grid layout and sorting order.

Viewing CI Inspections Eligible for Compensation

Complete the following steps to view close interval (CI) inspections eligible for telluric compensation in ISM:

- 1 Select one or more pipeline segments to work with in the *Select ROWs* window. Click  **Save** to close the window (Figure 14-27).

Choose pipeline segments with the option labeled *Telluric Compensation Required* enabled in *Edit ROW Detail*. See *Adding a Pipeline Information Record* (page 150) for more information if needed.

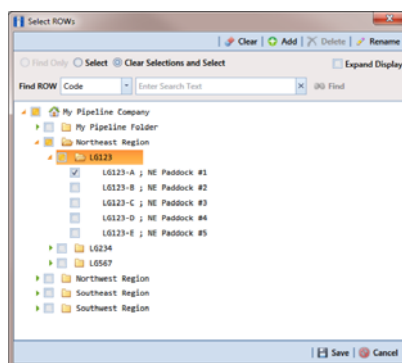


Figure 14-27. Select ROWs

- 2 If the ISM module is not open, click **Modules > Indirect Survey Manager (ISM)**.
- 3 Open the ISM data grid. Click **Data Entry > Edit ISM Data** (Figure 14-28).

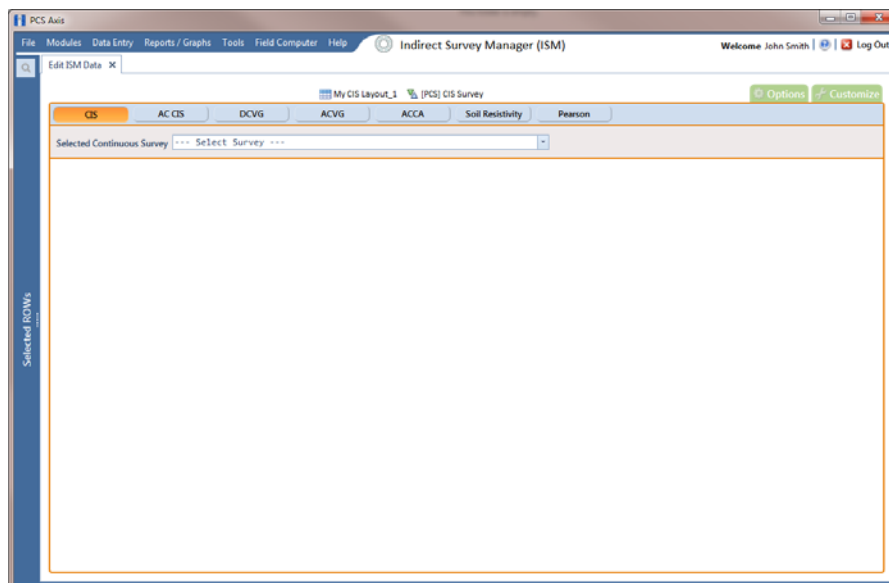
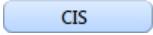
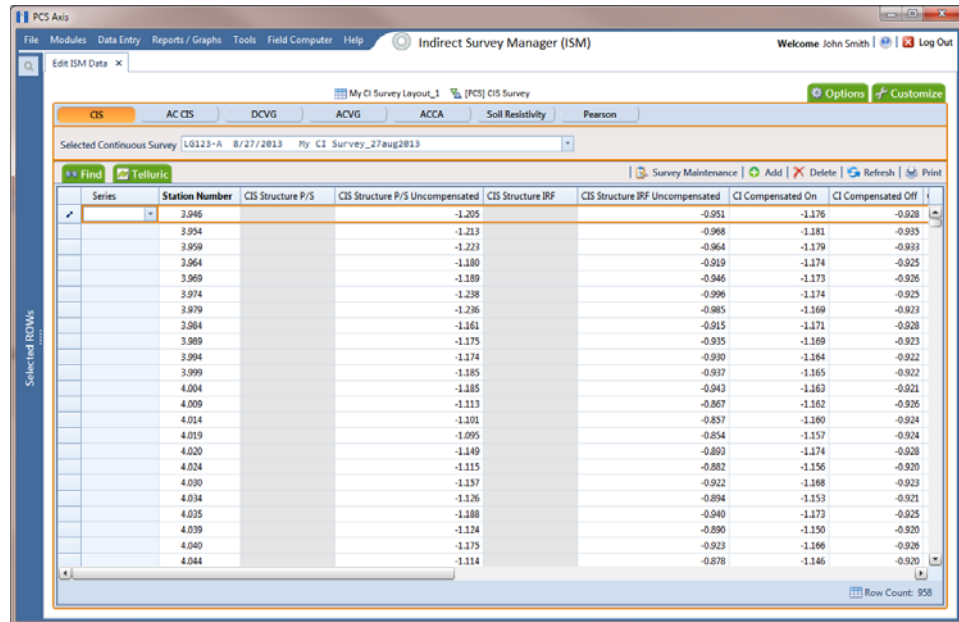


Figure 14-28. Edit ISM Data

- 4 Click the **CIS** button  to work with close interval survey data.
- 5 Select a survey folder with CI inspection readings you want to run telluric compensation. Click the down arrow in the field **Selected Continuous Survey** and select a survey folder in the selection list (Figure 14-29).

Inspection records eligible for compensation include voltage measurements in the fields labeled *CIS Structure P/S Uncompensated* and *CIS Structure IRF Uncompensated* (Figure 14-29).



Series	Station Number	CIS Structure P/S	CIS Structure P/S Uncompensated	CIS Structure IRF	CIS Structure IRF Uncompensated	CI Compensated On	CI Compensated Off
	3.946		-1.205		-0.951	-1.176	-0.928
	3.954		-1.213		-0.968	-1.181	-0.935
	3.959		-1.223		-0.964	-1.179	-0.933
	3.964		-1.180		-0.919	-1.174	-0.925
	3.969		-1.189		-0.946	-1.173	-0.926
	3.974		-1.238		-0.996	-1.174	-0.925
	3.979		-1.236		-0.985	-1.169	-0.923
	3.984		-1.161		-0.915	-1.171	-0.928
	3.989		-1.175		-0.935	-1.169	-0.923
	3.994		-1.174		-0.930	-1.164	-0.922
	3.999		-1.185		-0.937	-1.165	-0.922
	4.004		-1.185		-0.943	-1.163	-0.921
	4.009		-1.113		-0.867	-1.162	-0.926
	4.014		-1.101		-0.857	-1.160	-0.924
	4.019		-1.095		-0.854	-1.157	-0.924
	4.020		-1.149		-0.893	-1.174	-0.928
	4.024		-1.115		-0.882	-1.156	-0.920
	4.030		-1.157		-0.922	-1.168	-0.923
	4.034		-1.126		-0.894	-1.153	-0.921
	4.035		-1.188		-0.940	-1.173	-0.925
	4.039		-1.124		-0.890	-1.150	-0.920
	4.040		-1.175		-0.923	-1.166	-0.926
	4.044		-1.114		-0.878	-1.146	-0.920


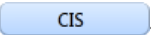

Figure 14-29. Edit ISM Data

Changing the Compensation Requirement

If you want to change the compensation requirement for a pipeline segment and related close interval (CI) inspections, use the *Maintenance* window available in the *Telluric* workspace to apply *Add Requirement* or *Remove Requirement* as needed.

IMPORTANT: Changing the compensation requirement must occur prior to running telluric compensation for a pipeline segment and associated CI inspections. The compensation requirement cannot be changed once telluric compensation has completed and results have been applied to the PCS Axis database.

To change the compensation requirement for a pipeline segment and associated CI inspections, follow these steps:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window (Figure 14-27, page 685).
- 2 Open the *CIS* data grid in *Edit ISM Data*. Click **Data Entry > Edit ISM Data > CIS** button .
- 3 Select a survey folder with survey readings you want to change the compensation requirement. Click the down arrow in the field **Selected Continuous Survey** and select a survey folder in the selection list (Figure 14-29, page 686).
- 4 Click the **Telluric** tab  to open the *Telluric* workspace (Figure 14-30).

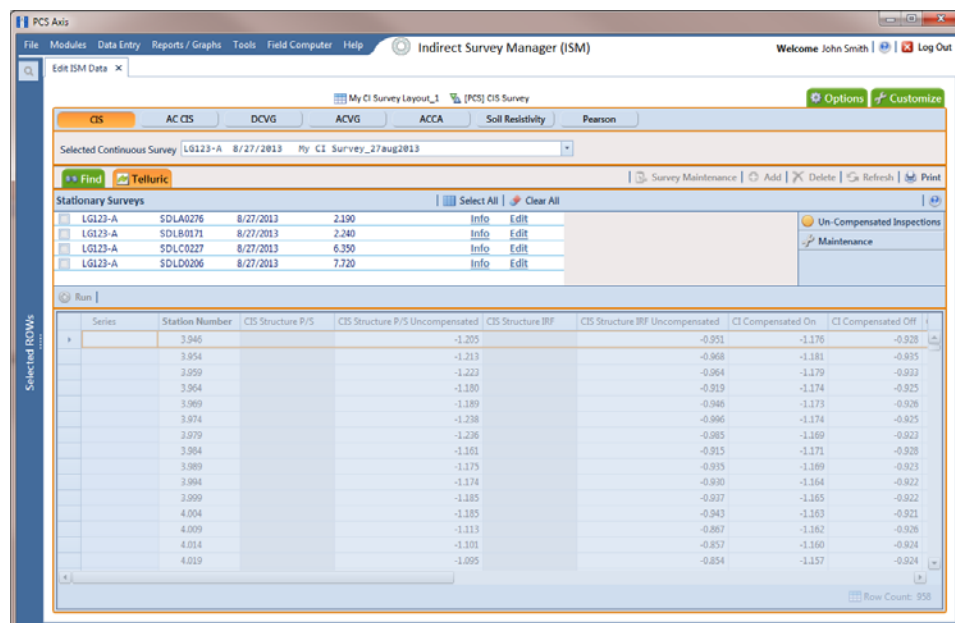




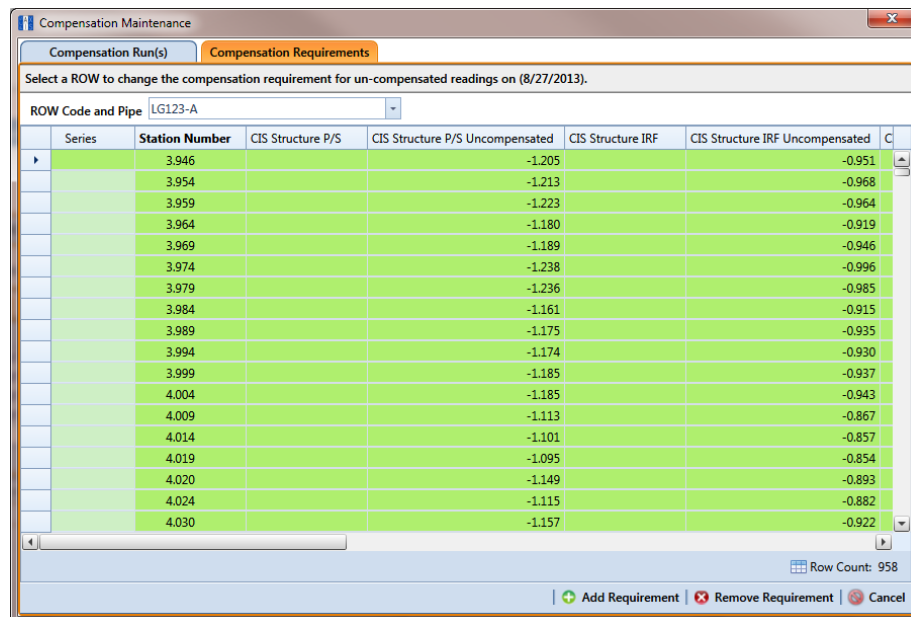


Figure 14-30. ISM Telluric Workspace

- 5 Click  **Maintenance** to open the *Maintenance* window and then click the **Compensation Requirements** tab (Figure 14-31).
 - 6 Click the down arrow in the field **ROW Code and Pipe** and select a pipeline segment in the selection list to view related CI inspections in the grid.
 - 7 Complete one of the following steps:
 - a To add the compensation requirement to the selected pipeline segment, click  **Add Requirement**.
 - b To remove the compensation requirement from the selected pipeline segment, click  **Remove Requirement**.
- After adding or removing the compensation requirement, PCS Axis closes the *Maintenance* window and returns to the *Telluric* workspace.
- c If you want to close the window without changing the current compensation requirement, click  **Cancel** to return to the *Telluric* workspace.




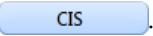

Series	Station Number	CIS Structure P/S	CIS Structure P/S Uncompensated	CIS Structure IRF	CIS Structure IRF Uncompensated
	3.946		-1.205		-0.951
	3.954		-1.213		-0.968
	3.959		-1.223		-0.964
	3.964		-1.180		-0.919
	3.969		-1.189		-0.946
	3.974		-1.238		-0.996
	3.979		-1.236		-0.985
	3.984		-1.161		-0.915
	3.989		-1.175		-0.935
	3.994		-1.174		-0.930
	3.999		-1.185		-0.937
	4.004		-1.185		-0.943
	4.009		-1.113		-0.867
	4.014		-1.101		-0.857
	4.019		-1.095		-0.854
	4.020		-1.149		-0.893
	4.024		-1.115		-0.882
	4.030		-1.157		-0.922

Figure 14-31. Maintenance

Running Telluric Compensation

Running telluric compensation takes place in the *Telluric* workspace of the *Edit ISM Data* grid. After receiving Allegro survey files and importing and evaluating SDL survey files, use the information in this section to run telluric compensation for inspections in a close interval (CI) survey that include telluric effects and require compensation.

Complete the following steps:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window (Figure 14-27, page 685).
- 2 Open the *CIS* data grid in *Edit ISM Data*. Click **Data Entry > Edit ISM Data > CIS** button .
- 3 Select a survey folder with CI inspections that you want to run compensation. Click the down arrow in the field **Selected Continuous Survey** and select a CI survey folder in the selection list (Figure 14-29, page 686).
- 4 Click the **Telluric** tab  to open the *Telluric* workspace (Figure 14-32, page 690).

A list of stationary data logger (SDL) survey files related to the selected pipeline segment and CI survey display in the *Stationary Surveys* group box of the *Telluric* workspace (Figure 14-32, page 690).

- 5 If you want to view a telluric summary of an SDL survey listed in the *Stationary Surveys* group box, click the **Info** link to open the *Stationary Telluric Info* window. For a description of this window, see *View Telluric Summary Information* (page 662).
- 6 If you want to view voltage measurements associated with an SDL survey listed in the *Stationary Surveys* group box, click the **Edit** link to open the *Stationary Survey Maintenance* window. A description of this window is available in the section entitled *Using Stationary Survey Maintenance* (page 654).

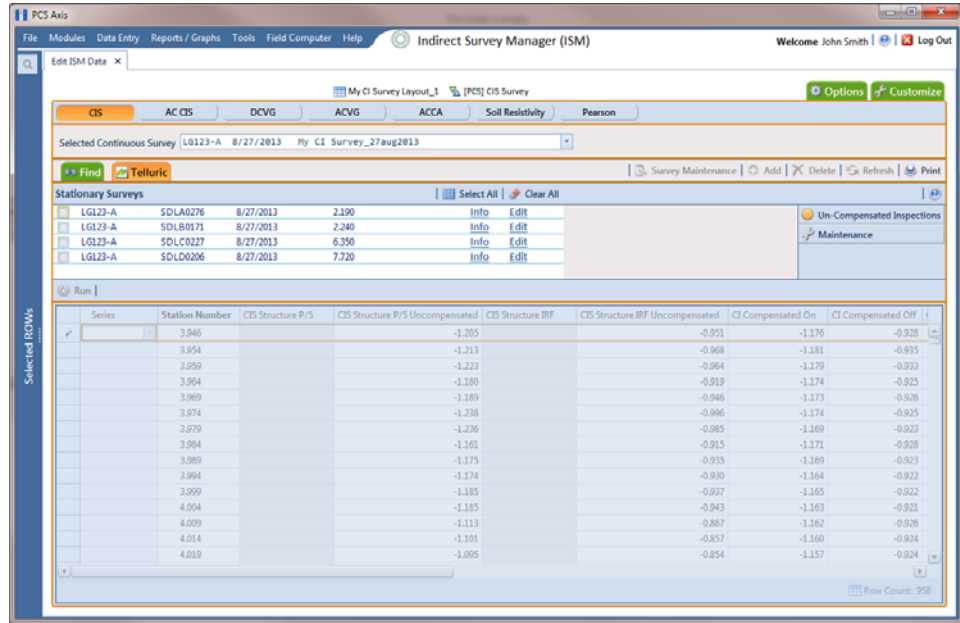


Figure 14-32. Telluric Workspace

- 7 To run telluric compensation, follow these steps:
 - a Select the SDL upstream/downstream data set pair to use in the compensation run. Click the check box associated with the upstream and downstream SDL survey files (Figure 14-33).

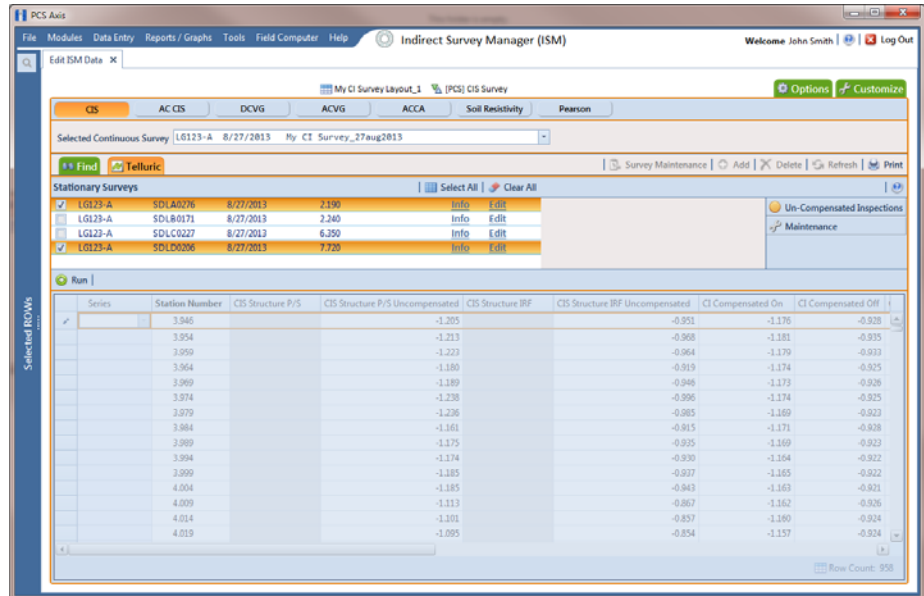



Figure 14-33. Telluric Workspace

- b Click  **Run** to begin the compensation process and open the *Compensation Results* window (Figure 14-34).

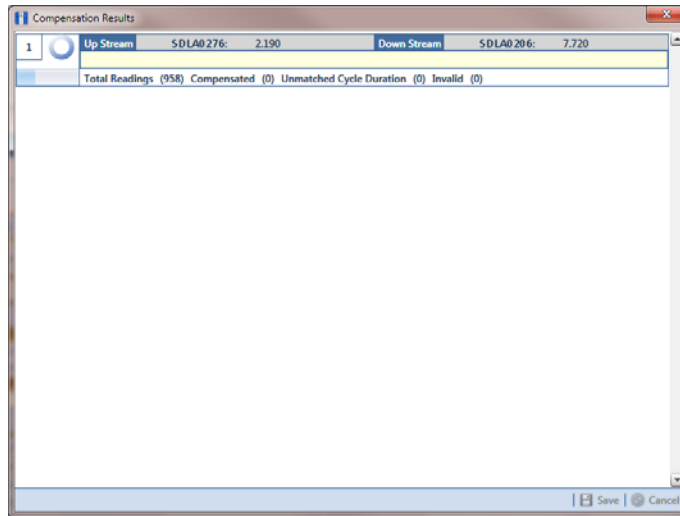



Figure 14-34. Compensation Results

- c If an error occurs during the compensation run, a  warning icon displays in the *Compensation Results* window. A description of the error and how to resolve it also display.

In the following example, the survey measurement must be changed to zero to apply no telluric correction and successfully run compensation (Figure 14-35). See *Uncompensating Test Point Inspections* (page 682) for information about how to apply *ForceZero* and *Exclude* to survey measurements.

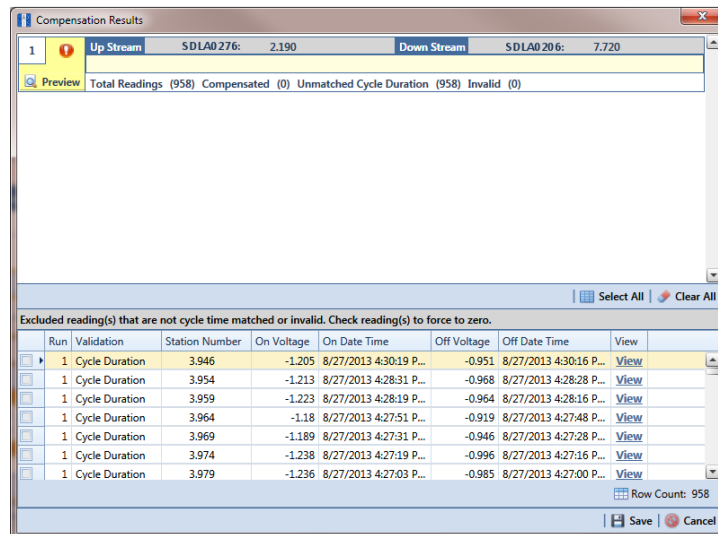



Figure 14-35. Warning in Compensation Results

- d When the compensation process completes, click  **Preview** to view a graph of compensation results (Figure 14-36).

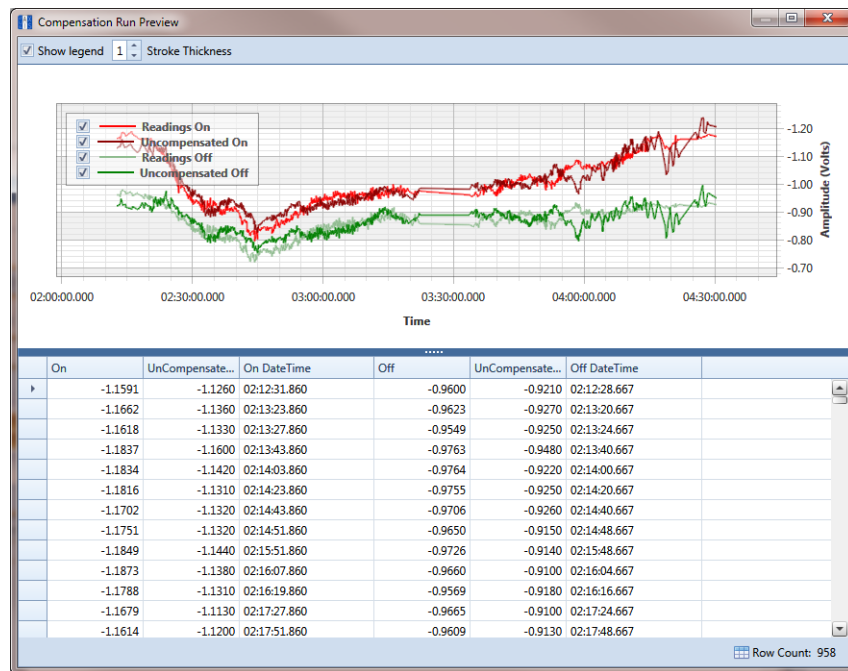





Figure 14-36. Compensation Run Preview


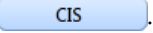



- e When you finish viewing the graph, click the  Windows close button to close the graph and return to the *Compensation Results* window.
- f If you want to apply compensation results to the PCS Axis database, click  **Save** in the *Compensation Results* window.

Clicking  **Cancel** cancels the compensation process. PCS Axis closes the window and returns to the *Telluric* workspace. Compensation results are not applied to the PCS Axis database.

Reversing a Compensation Run in ISM

If you want to reverse (undo) one or more compensation runs in ISM, use the *Maintenance* window available in the *Telluric* workspace to view a list of completed compensation runs available for uncompensation. After reversing a compensation run, the data grid in *Edit ISM Data* updates with uncompensated close interval (CI) inspections.

Complete the following steps to reverse a compensation run in ISM:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window.
- 2 Open the *CIS* data grid in *Edit ISM Data*. Click **Data Entry > Edit ISM Data > CIS** button .
- 3 Select a survey folder with CI inspections you want to reverse (undo) a compensation run. Click the down arrow in the **Selected Continuous Survey** field and select a survey folder in the selection list (Figure 14-29, page 686).
- 4 Click the **Telluric** tab  to open the *Telluric* workspace (Figure 14-30, page 687).
- 5 Click  **Maintenance** to open the *Maintenance* window (Figure 14-37, page 693).
- 6 If the *Compensation Run(s)* grid is not visible, click the **Compensation Run(s)** tab to view a list of compensation runs.
- 7 Click the check box associated with the compensation run you want to reverse. Then click  **Save** to reverse (undo) the selected compensation run.

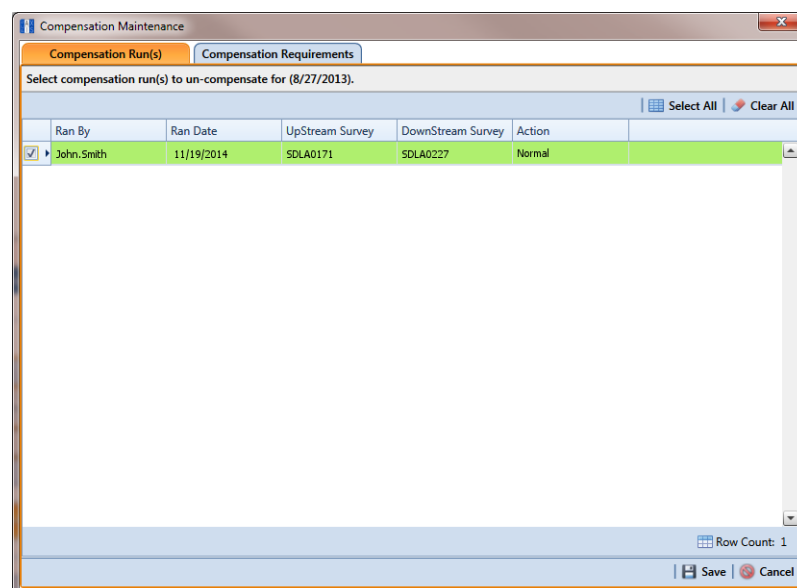



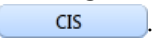




Figure 14-37. Maintenance

Uncompensating CI Test Point Inspections

If you want to exclude one or more close interval (CI) inspections in a compensation run, or want to change the telluric compensation to zero (0) for one or more CI inspections, use the *Un-Compensated Inspections* window in the *Telluric* workspace to apply *ForceZero* or *Exclude* as needed.

ForceZero applies no telluric correction to the selected CI inspection(s). *Exclude* removes the selected CI inspection(s) from the compensation run.

Complete the following steps to uncompensate one or more CI inspections in a compensation run:

- 1 Select the pipeline segment you want to work with in the *Select ROWs* window. Then click  **Save** to close the window.
- 2 Open the *CIS* data grid in *Edit ISM Data*. Click **Data Entry > Edit ISM Data > CIS** button .
- 3 Select a survey folder with CI inspections you want to reverse (undo) a compensation run. Click the down arrow in the **Selected Continuous Survey** field and select a survey folder in the selection list (Figure 14-29, page 686).
- 4 Click the **Telluric** tab  to open the *Telluric* workspace (Figure 14-30, page 687).
- 5 Click  **Un-Compensated Inspections** to open the *Un-Compensated Inspections* window. Then click the down arrow in the **Action** field and select **ForceZero** or **Exclude** (Figure 14-38, page 695).
- 6 Click the check box for each CI inspection you want to uncompensate. Click  **Save** to begin the uncompensate process or  **Cancel** to close the window and return to the *Telluric* workspace.

Un-Compensated Inspections

Inspections that require compensation, but have not had a compensation run applied. Either apply a Zero correction, or Exclude.

Action: Exclude | Exclude from Telluric Compensation

Select All | Clear All

Series	Station Number	CIS Structure P/S	CIS Structure P/S Uncompensated	CIS Structure IRF	CIS Structure IRF Uncompensated	CI C
<input type="checkbox"/>	3.946		-1.205		-0.951	
<input checked="" type="checkbox"/>	3.954		-1.213		-0.968	
<input type="checkbox"/>	3.959		-1.223		-0.964	
<input checked="" type="checkbox"/>	3.964		-1.180		-0.919	
<input type="checkbox"/>	3.969		-1.189		-0.946	
<input checked="" type="checkbox"/>	3.974		-1.238		-0.996	
<input type="checkbox"/>	3.979		-1.236		-0.985	
<input checked="" type="checkbox"/>	3.984		-1.161		-0.915	
<input type="checkbox"/>	3.989		-1.175		-0.935	
<input checked="" type="checkbox"/>	3.994		-1.174		-0.930	
<input type="checkbox"/>	3.999		-1.185		-0.937	
<input type="checkbox"/>	4.004		-1.185		-0.943	
<input type="checkbox"/>	4.009		-1.113		-0.867	
<input type="checkbox"/>	4.014		-1.101		-0.857	
<input type="checkbox"/>	4.019		-1.095		-0.854	
<input checked="" type="checkbox"/>	4.020		-1.149		-0.893	
<input type="checkbox"/>	4.024		-1.115		-0.882	
<input type="checkbox"/>	4.030		-1.157		-0.922	

Row Count: 958

Save | Cancel

Figure 14-38. Un-Compensated Inspections

