Ton Miles Calculator

Disclaimer

These tools and materials are provided 'as is' without warranties of any kind, express or implied.

Please verify the tools provided by this application by yourself before you use them. Ensure you understand the impact of using these tools.

Any use you choose to make of these tools & materials is undertaken by you entirely at your own risk.

Note:

This app was created with an educational proposal to help students and teachers of drilling engineering and has no intention of replace the professional software provided by oil field companies.
It is also an useful tool for other professionals in the oilfield, such as technicals and engineers.

Thanks
This application provides an useful tools for use of Wire Rope (Drilling Line) for Oil Field Service and in the drilling engineering schools.

This app was developed based on API Recommended Practice RP 9B.

Applied for Oil Field Operations:

- Round-Trip
- Half Trip
- Short Trip
- Drilling
- Coring
- Setting Casing
- Setting Liner
- Running Riser

Also can be applied for tripping on workover operations

This app was the first application available on the App Store about this ton-miles calculation for drilling operations.
CAPÍTULO 2

Main Menu

Recommended Practice for a better experience with this tool applied on oil field operations:

1. Select a data file
2. Set the unit system
3. Set rig data parameters
4. Set drilling line parameters
5. For single calculations:
   Access directly the operations
6. For control and historical
   Access “Ton Miles Control”

7. Check the formulas used by this application and compare the results with other applications.
CAPÍTULO 3
Data Files

This app work with the extension *.tmdf

It’s recommended first to create a data file to work with this app and to enable the “Auto Save”.

Data Files on My Device

This application opens only data files in the local documents folder of this application.

iCloud (iOS 7 or greater)
- Use this option to retrieve data files sent to iCloud from other compatibles apps on iOS 7 or OS X.
- Use this option also to share data with other apps compatibles installed in this device.

iCloud Drive (iOS 8 or greater)
- Use the iCloud Drive option to download/upload data files on iCloud Drive or other storage providers accessible via iCloud Drive interface.

Dropbox (iOS 8 or greater)
Import a data file from Dropbox.

Open in...
Open the selected file with other apps like file managers, storage providers (Dropbox, ...).
### Data File on iCloud

1. Check iCloud Settings
2. **iCloud Drive --> ON**

---

**iCloud Container:**

- Use this option to retrieve data files sent to iCloud from iOS 7 or OS X.

#### Data Files on iCloud

<table>
<thead>
<tr>
<th>File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 01 test iCloud Drive.tmdf</td>
</tr>
<tr>
<td>TM 01 test iCloud.tmdf</td>
</tr>
<tr>
<td>TM 01.tmdf</td>
</tr>
<tr>
<td>TM 04 to iCloud iPad.tmdf</td>
</tr>
</tbody>
</table>

---

**User Name**

Apple ID

Family information is not available.

**Storage**

3.4 GB Available

---

**iCloud Drive**

[On]
**iCloud Driver:**

Use this option to download/upload data files on iCloud Drive or other storage providers accessible via iCloud Drive interface.

1. Use iCloud Drive on a Mac or PC to create a directory to storage your files.
2. Import/export data files with extension (*.tdmf) from/to iCloud Drive.

- ![download from iCloud Drive](image)
- ![upload to iCloud Drive](image)
Accessing other Storage Providers via iCloud Drive interface:
Data Files on Dropbox

1. Install the Dropbox app on your device
2. Do a login in the Dropbox app

Download from Dropbox:
This tool can only to import from Dropbox provider.

Please Install the Dropbox App
With Dropbox installed, you can access all your stuff in your favorite apps, like this one!

Install Dropbox
Upload to Dropbox:
To submit a data file to Dropbox provider, use the **Open In...** button and open it in the Dropbox app:

- **TM 03.tmdf**
- **TM 04 to iCloud iPad.tmdf**
- **TM 04.tmdf**

Tap to share with AirDrop

**AirDrop.** Share with people nearby. If you don’t see them, have them turn on AirDrop in Control Center on iOS, or go to AirDrop in Finder on a Mac.
SEÇÃO 3

Creating a New File

1. Input the file name in text box and tap on [+ New File] button.
2. Confirm (Yes)
3. The file is created with values = 0.

File Name
TM Miles New File

+ New File   Save

Download options:
- download from iCloud
- download from iCloud Drive
- download from Dropbox

Open

Delete

Send by email

Upload to iCloud

Upload to iCloud Drive

Open in...
### SEÇÃO 4

**Open a Data File**

When Tap on “Open” button, the data that are on the Data File Highlighted are loaded.

The current text shows the data file open.

<table>
<thead>
<tr>
<th>File Name</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 03</td>
<td></td>
</tr>
<tr>
<td>+ New File</td>
<td></td>
</tr>
<tr>
<td>TM 02.tmdf</td>
<td></td>
</tr>
<tr>
<td>TM 03.tmdf</td>
<td></td>
</tr>
<tr>
<td>TM Miles New File.tmdf</td>
<td></td>
</tr>
</tbody>
</table>

- download from iCloud
- download from iCloud Drive
- download from Dropbox

- Open
- delete
- send by email
- upload to iCloud
- upload to iCloud Drive
- open in...
Save As...

1. Input the File Name in the TextBox.
2. Tap on the Save button.
3. The data in memory are saved in the data file.
4. This feature is also useful to copy or duplicate a data file.
SEÇÃO 6

Delete a Data File

1. Tap on data file to select.
2. Tap on button.
3. Note: Delete the file selected and not the current file.

File Name

TM 04

+ New File    Save

TM 01.tmdf
TM 02.tmdf
TM 03.tmdf
TM 04.tmdf
TM Miles New File.tmdf

Open

delete

Current: #
Send a data file by e-mail

1. Tap on data file to select.
2. Tap on ✉️ button.
3. Note: Send the file selected and not the current

1. Input the mail address to send:
2. Edit the subject.

Note: Configure an account mail on Mail app

---

To: email_to_send
Cc/Bcc:
Subject: Ton Miles Calculator

test 4.tmdf
CAPÍTULO 4

The Unit System

1. Select the units per parameters
2. or select per system: Metric, SI or Oilfield

Note: The unit conversion in this application is OilField based.
The Rig Data

Set the parameters of rig / equipaments
- Rig Name
- Traveling Block Assembly
- Number of Lines in the system
- Draw Work Drum Diameter
- Maker and Model
- Drum Type: PLain or Gloved
- Drilling System: Top Drive or Kelly

Note:
All data used in this manual are hypothetical to facilitate the explanation only
### Capítulo 6

**The Drilling Line**

Set the parameters of the Drilling Line.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>09</th>
<th>Maker</th>
<th>wire rope co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>1.5000</td>
<td>in</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>6 x 19</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Original Length</td>
<td>2000</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Installation Date</td>
<td>01/05/2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ton Miles Calculator for iPad**

<table>
<thead>
<tr>
<th></th>
<th>Initial Data</th>
<th>Slip / Cut Off</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ton Miles to Slip</td>
<td>4000</td>
<td>TM</td>
<td></td>
</tr>
<tr>
<td>Length to Slip</td>
<td>100.00</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Ton Miles to Cut Off</td>
<td>12000</td>
<td>TM</td>
<td></td>
</tr>
<tr>
<td>Length to Cut Off</td>
<td>300.00</td>
<td>ft</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Initial Data</th>
<th>Slip / Cut Off</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative to Slip</td>
<td>650</td>
<td>TM</td>
<td></td>
</tr>
<tr>
<td>Cumulative to Cut Off</td>
<td>7500</td>
<td>TM</td>
<td></td>
</tr>
<tr>
<td>Length on Reel</td>
<td>2000</td>
<td>ft</td>
<td></td>
</tr>
</tbody>
</table>
CAPÍTULO 7
Ton Miles for Tripping

1. Set the parameters of the drill string and depths.
2. Select the operation for calculations:
   - Round Trip or Half Trip
   - Complete or Short Trip

\[ T_r = \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2} C)}{2,640,000} \]

- \( T_r \) = ton-miles [weight in short tons (2,000 lb) times distance moved in miles]
- \( D \) = measured depth of drill string, ft.
- \( L_s \) = length of one drill-pipe stand, ft.
- \( W_m \) = effective (buoyed) weight per foot of drill-pipe in drilling fluid, lb.
- \( M \) = total weight of traveling block-elevator assembly, lb.
- \( C \) = effective (buoyed) weight of bottom hole assembly (BHA) in drilling fluid minus the effective (buoyed) weight of the same length of drill-pipe in drilling fluid, lb.

**Round Trip:** \( TM = T_r \)

**Half Trip:** \( TM = \frac{1}{2} \times T_r \)

**Short Trip** = \( T_r,\text{deeper} - T_r,\text{shallower} \)

Measured Depth = 3000.00 ft

Shallower Depth = 2000.00 ft

Deeper Depth = 3000.00 ft
## Ton Miles for Tripping

### DRILLPIPE / TUBING
- **Outer Diameter**: 5.0000 inches
- **Nominal Weight**: 19.50 lb/ft
- **Stand Length**: 93.00 ft

### Ton Miles
- **Ton Miles**: 347.35

### Section Details
- **Section**: DP/TUB
  - Length: 3326.00 ft
  - Weight: 43581.84 lb
  - Effective lb: 37260.80 lb
- **Section**: HW
  - Length: 558.00 ft
  - Weight: 27509.40 lb
  - Effective lb: 23519.49 lb
- **Section**: DC
  - Length: 1116.00 ft
  - Weight: 103787.99 lb
  - Effective lb: 88734.77 lb
- **Section**: Others
  - Length: 5000.00 ft
  - Weight: 174879.23 lb
  - Effective lb: 149515.06 lb

## Drilling Details
- **Measured Depth Start**: 5000.00 ft
- **Measured Depth End**: 6000.00 ft
### Ton Miles Calculator for iPad

**Ton Miles**

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip to change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
</tbody>
</table>

**By Name**

- Name: driller

**Date of Operation**

- 2015-05-16

**Well Name**

- my well

**Well Depth**

- 5000.00 ft

**Operation**

- round trip to change bit

**Safety Factor**

- 10%

**TM w/ Safety Factor**

- 382.08

**Cumulative To Slip**

- 0 / 4000

**Cumulative To Cut Off**

- 0 / 12000

**Line Length on Reel**

- 2000.0 ft

**Add To Control**

- Current: 1 / 1

---

**Ton Miles**

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip to change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
</tbody>
</table>

**By Name**

- Name: driller

**Date of Operation**

- 2015-05-16

**Well Name**

- my well

**Well Depth**

- 5000.00 ft

**Operation**

- round trip to change bit

**Safety Factor**

- 10%

**TM w/ Safety Factor**

- 382.08

**Cumulative To Slip**

- 382 / 4000

**Cumulative To Cut Off**

- 382 / 12000

**Line Length on Reel**

- 2000.0 ft

**Add To Control**

- Current: 2 / 2

---

**www.wellcontrol.com.br**
CAPÍTULO 8
Ton Miles for Drilling

Set the parameters of the drill string and depths.

\[ T_r = \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \]

- \( T_r \) = ton-miles [weight in short tons (2,000 lb) times distance moved in miles]
- \( D \) = measured depth of drill string, ft.
- \( L_s \) = length of one drill-pipe stand, ft.
- \( W_m \) = effective (buoyed) weight per foot of drill-pipe in drilling fluid, lb.
- \( M \) = total weight of traveling block-elevator assembly, lb.
- \( C \) = effective (buoyed) weight of bottom hole assembly (BHA) in drilling fluid minus the effective (buoyed) weight of the same length of drill-pipe in drilling fluid, lb.

**With Kelly:**
- with Reaming: \( TM = 3 \times (T_r, \text{end} - T_r, \text{start}) \)
- without Reaming: \( TM = 2 \times (T_r, \text{end} - T_r, \text{start}) \)

**With Top Drive:**
- with Reaming: \( TM = 2 \times (T_r, \text{end} - T_r, \text{start}) \)
- without Reaming: \( TM = (T_r, \text{end} - T_r, \text{start}) \)
### Ton Miles for Drilling

**f(x)**

<table>
<thead>
<tr>
<th>Top Drive</th>
<th>Kelly</th>
<th>Without Reaming</th>
<th>With Reaming</th>
</tr>
</thead>
</table>

### DRILLPIPE

- **Outer Diameter**: 5.0000 inches
- **Nominal Weight**: 19.50 lb/ft
- **Stand Length**: 93.00 ft

<table>
<thead>
<tr>
<th>Drillpipe</th>
<th>HW</th>
<th>DC</th>
<th>Others</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mud Weight</td>
<td>9.50 ppg</td>
<td>Buoyancy Factor</td>
<td>0.855</td>
<td></td>
</tr>
<tr>
<td>Traveling Block Assembly</td>
<td>120000 lb</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ton Miles

- **Ton Miles**: 78.94

### Section Details

<table>
<thead>
<tr>
<th>Section</th>
<th>Length ft</th>
<th>Weight lb</th>
<th>Effective lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP</td>
<td>4326.00</td>
<td>56685.21</td>
<td>48463.69</td>
</tr>
<tr>
<td>HW</td>
<td>558.00</td>
<td>27509.40</td>
<td>23519.49</td>
</tr>
<tr>
<td>DC</td>
<td>1116.00</td>
<td>103787.99</td>
<td>88734.77</td>
</tr>
<tr>
<td>Others</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6000.00</td>
<td>187982.59</td>
<td>160717.94</td>
<td></td>
</tr>
</tbody>
</table>

### Drilling

- **Measured Depth Start**: 5000.00 ft
- **Measured Depth End**: 6000.00 ft
### Saving the calculations

Tap on the Save button to save the data and return to the view.

<table>
<thead>
<tr>
<th><strong>Ton Miles</strong></th>
<th>78.94</th>
<th><strong>Drilling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>By Name</strong></td>
<td>driller</td>
<td></td>
</tr>
<tr>
<td><strong>Date of Operation</strong></td>
<td>2015-05-16</td>
<td></td>
</tr>
<tr>
<td><strong>Well Name</strong></td>
<td>my well</td>
<td></td>
</tr>
<tr>
<td><strong>Well Depth</strong></td>
<td>5000.00 ft</td>
<td></td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety Factor</strong></td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td><strong>TM w/ Safety Factor</strong></td>
<td>86.84</td>
<td></td>
</tr>
</tbody>
</table>

| **Cumulative To Slip** | 382 / 4000 |
| **Cumulative To Cut Off** | 382 / 12000 |
| **Line Length on Reel** | 2000.0 ft |

<table>
<thead>
<tr>
<th><strong>Item</strong></th>
<th><strong>Date</strong></th>
<th><strong>Description</strong></th>
<th><strong>Type</strong></th>
<th><strong>Ton Miles</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip to change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>Drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
</tbody>
</table>

**By Name**: driller
**Date of Operation**: 2015-05-16
**Well Name**: my well
**Well Depth**: 5000.00 ft
**Operation**: Drilling 5000 @ 6000
**Safety Factor**: 10%

**TM w/ Safety Factor**: 86.84
CAPÍTULO 9

Ton Miles for Coring

Set the parameters of the drill string and depths.

\[ T_r = \frac{D(L_s + D)W_m}{10,560,000} + \frac{D\left(M + \frac{1}{2} C\right)}{2,640,000} \]

\( T_r \) = ton-miles [weight in short tons (2,000 lb) times distance moved in miles]

\( D \) = measured depth of drill string, ft.

\( L_s \) = length of one drill-pipe stand, ft.

\( W_m \) = effective (buoyed) weight per foot of drill-pipe in drilling fluid, lb.

\( M \) = total weight of traveling block-elevator assembly, lb.

\( C \) = effective (buoyed) weight of bottom hole assembly (BHA) in drilling fluid minus the effective (buoyed) weight of the same length of drill-pipe in drilling fluid, lb.

\[ TM = 2 \times (T_r,\text{end} - T_r,\text{start}) \]
Ton Miles Calculator for iPad

Ton Miles for Coring

**DRILLPIPE**

- Outer Diameter: 5.0000 inches
- Nominal Weight: 19.50 lb/ft
- Stand Length: 93.00 ft

**Mud Weight**: 9.50 ppg
- Buoyancy Factor: 0.855

**Traveling Block Assembly**: 120000 lb

**Ton Miles**: 8.06

<table>
<thead>
<tr>
<th>Section</th>
<th>Length ft</th>
<th>Weight lb</th>
<th>Effective lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP</td>
<td>4376.00</td>
<td>57340.39</td>
<td>49023.84</td>
</tr>
<tr>
<td>HW</td>
<td>558.00</td>
<td>27509.40</td>
<td>23519.49</td>
</tr>
<tr>
<td>DC</td>
<td>1116.00</td>
<td>103787.99</td>
<td>88734.77</td>
</tr>
<tr>
<td>Others</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>6050.00</td>
<td>188637.78</td>
<td>161278.09</td>
</tr>
</tbody>
</table>

**Saved**

- Measured Depth Start: 6000.00 ft
- Measured Depth End: 6050 ft
Saving the calculations

Tap on Save button to the next view and edit the data.

<table>
<thead>
<tr>
<th>Ton Miles</th>
<th>8.06</th>
<th>Coring</th>
</tr>
</thead>
</table>

By Name  
- driller

Date of Operation  
- 2015-05-16

Well Name  
- my well

Well Depth  
- 6050 ft

Operation  
- Coring 6000 @ 6050

Safety Factor  
- 10 %

TM w/ Safety Factor  
- 8.87

Add To Control

Cumulative To Slip  
- 469 / 4000

Cumulative To Cut Off  
- 469 / 12000

Line Length on Reel  
- 2000.0 ft

Current  
- 3 / 3

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip to change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>Drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16</td>
<td>Coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
</tbody>
</table>
CAPÍTULO 10

Ton Miles for Setting Casing

Set the parameters of the drill string and depths.

Running Casing

\[ TM = \frac{1}{2} \times \left( \frac{D(L_{cs} + D)W_{cm}}{10,560,000} + \frac{DM}{2,640,000} \right) \]

- \( Tr \) = ton-miles [weight in short tons (2,000 lb) times distance moved in miles]
- \( D \) = total casing length, ft.
- \( L_{cs} \) = length of one casing joint, ft.
- \( W_{cm} \) = effective (buoyed) weight per foot of one casing joint in drilling fluid, lb.
- \( M \) = total weight of traveling block-elevator assembly, lb.
**Ton Miles Calculator for iPad**

**Ton Miles for Setting Casing**  

- **Average Length /joint**: 36 ft  
- **Weight /joint**: 1: 47.00 lb/ft, 2: 0.00 lb/ft  
- **Total Length**: 1: 6000 ft, 2: 0.0 ft  
- **Mud Weight**: 9.50 ppg  
- **Buoyancy Factor**: 0.855  
- **Traveling Block**: 120000 lb

**Ton Miles**: 205.27

**Saving the calculations**

Tap on Save button to the next view and edit the data.

**Ton Miles**

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip for change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16</td>
<td>coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
</tbody>
</table>
Ton Miles with Landing String to Setting Casing, normally on Subsea stack operations (deep water):

1. Running Casing/Liner joints

\[
TM = \frac{1}{2} \times \left( \frac{D(L_{cs} + D)W_{cm}}{10,560,000} + \frac{DM}{2,640,000} \right)
\]

- \(D\) = total casing/liner length, ft.
- \(L_{cs}\) = length of one casing/liner joint, ft.
- \(W_{cm}\) = effective (buoyed) weight per foot of one casing/liner joint in drilling fluid, lb.

2. Landing String with Casing / Liner

\[
TM = \frac{1}{2} \times \left( \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \right)
\]

- \(D\) = landing string length, ft.
- \(L_s\) = length of landing string stand, ft.
- \(W_m\) = effective weight per foot, lb (of one pipe)
- \(C\) = effective (buoyed) weight of excess BHA plus total casing/liner weight in drilling fluid, lb.

3. Landing String Tripping out (half trip)

\[
TM = \frac{1}{2} \times \left( \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \right)
\]

- \(C\) = effective (buoyed) weight of excess BHA, lb.
**Ton Miles for Setting Casing**

<table>
<thead>
<tr>
<th>Average Length /joint</th>
<th>36.00 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight /joint</td>
<td>1: 47.00 lb/ft 2: 0.00 lb/ft</td>
</tr>
<tr>
<td>Total Length</td>
<td>1: 4000.0 ft 2: 0.0 ft</td>
</tr>
<tr>
<td>Mud Weight</td>
<td>9.50 ppg</td>
</tr>
<tr>
<td>Buoyancy Factor</td>
<td>0.855</td>
</tr>
<tr>
<td>Traveling Block</td>
<td>120000 lb</td>
</tr>
</tbody>
</table>

**Editing the Landing String:**

Tap on icon 📝

**Landing String**

<table>
<thead>
<tr>
<th>Landing String Length</th>
<th>2000 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing Length</td>
<td>4000.00 ft</td>
</tr>
<tr>
<td>Casing Shoe</td>
<td>6000.00 ft</td>
</tr>
</tbody>
</table>

**Standing**

<table>
<thead>
<tr>
<th>Landing String</th>
<th>2000.00 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing Length</td>
<td>4000.00 ft</td>
</tr>
<tr>
<td>Casing Shoe</td>
<td>6000.00 ft</td>
</tr>
<tr>
<td>Running Casing Joints</td>
<td>121.62 ft</td>
</tr>
<tr>
<td>Landing String w/ Casing</td>
<td>95.18 ft</td>
</tr>
<tr>
<td>Landing String Tripping out</td>
<td>64.73 ft</td>
</tr>
</tbody>
</table>

**Ton Miles**

| Ton Miles | 281.53 |
CAPÍTULO 11

Ton Miles for Setting Liner

Set the parameters of the drill string and depths.

1. Running Casing/Liner joints

   \[ TM = \frac{1}{2} \times \left( \frac{D(L_{cs} + D)W_{cm}}{10,560,000} + \frac{DM}{2,640,000} \right) \]

   - \( D \) = total casing/liner length, ft.
   - \( L_{cs} \) = length of one casing/liner joint, ft.
   - \( W_{cm} \) = effective (buoyed) weight per foot of one casing/liner joint in drilling fluid, lb.

2. Landing String with Casing / Liner

   \[ TM = \frac{1}{2} \times \left( \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \right) \]

   - \( D \) = landing string length, ft.
   - \( L_s \) = length of landing string stand, ft.
   - \( W_m \) = effective weight per foot, lb (of one pipe)
   - \( C \) = effective (buoyed) weight of excess BHA plus total casing/liner weight in drilling fluid, lb.

3. Landing String Tripping out (half trip)

   \[ TM = \frac{1}{2} \times \left( \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \right) \]

   - \( C \) = effective (buoyed) weight of excess BHA, lb.
### Ton Miles for Setting Liner

- **Average Length /joint**: 36.00 ft
- **Weight /joint**: 1: 26.00 lb/ft, 2: 0.00 lb/ft
- **Total Length**: 1: 2000.0 ft, 2: 0.0 ft
- **Mud Weight**: 9.50 ppg
- **Buoyancy Factor**: 0.855
- **Traveling Block**: 120000 lb

### Landing String

- **Outer Diameter**: 5.0000 inches
- **Nominal Weight**: 19.50 lb/ft
- **Stand Length**: 93.00 ft

#### Stand

- **Landing String**: 4000.00 ft
- **Liner Length**: 2000.00 ft
- **Liner Shoe**: 6000.00 ft
- **Running Liner Joints**: 49.74
- **Landing String w/ Liner**: 152.62
- **Landing String Tripping out**: 135.78
- **Ton Miles**: 338.14

#### Others

- **Landing String**: 4000.00 ft
- **Liner Length**: 2000.00 ft
- **Liner Shoe**: 6000.00 ft
- **Running Liner Joints**: 49.74
- **Landing String w/ Liner**: 152.62
- **Landing String Tripping out**: 135.78
- **Ton Miles**: 338.14

#### Depth

- **Landing String**: 4000.00 ft
- **Liner Length**: 2000.00 ft
- **Liner Shoe**: 6000.00 ft
- **Running Liner Joints**: 49.74
- **Landing String w/ Liner**: 152.62
- **Landing String Tripping out**: 135.78
- **Ton Miles**: 338.14
### Ton Miles Calculator for iPad

**Ton Miles:** 338.14  **Liner**

<table>
<thead>
<tr>
<th>By Name</th>
<th>driller 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Operation</td>
<td>2015-05-17</td>
</tr>
<tr>
<td>Well Name</td>
<td>my well</td>
</tr>
<tr>
<td>Well Depth</td>
<td>6050.00 ft</td>
</tr>
<tr>
<td>Operation</td>
<td>Setting liner @ 6000</td>
</tr>
<tr>
<td>Safety Factor</td>
<td>10 %</td>
</tr>
</tbody>
</table>

**TM w/ Safety Factor:** 371.95  **Add To Control**

<table>
<thead>
<tr>
<th>Cumulative To Slip</th>
<th>704 / 4000</th>
<th>1076 / 4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative To Cut Off</td>
<td>704 / 12000</td>
<td>1076 / 12000</td>
</tr>
<tr>
<td>Line Length on Reel</td>
<td>2285.0 ft</td>
<td>2285.0 ft</td>
</tr>
</tbody>
</table>

#### Current Record:

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip for change bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16</td>
<td>coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
<tr>
<td>5</td>
<td>2015-05-17</td>
<td>casing @ 6000</td>
<td>Casing</td>
<td>225.80</td>
</tr>
<tr>
<td>6</td>
<td>2015-05-17</td>
<td>Setting liner @ 6000</td>
<td>Liner</td>
<td>371.95</td>
</tr>
</tbody>
</table>

- Item: Sequence of the record entry.
- Date: Date of the operation.
- Description: Description of the operation.
- Type: Type of the operation.
- Ton Miles: Ton miles for each operation entry.
CAPÍTULO 12
Ton Miles for Running Riser

Set the parameters of the drill string and depths.

\[ T_r = \frac{D(L_s + D)W_m}{10,560,000} + \frac{D(M + \frac{1}{2}C)}{2,640,000} \]

- D = total riser length, ft.
- Ls = length of one riser joint, ft.
- Wm = effective (buoyed) weight per foot of one riser joint in sea water, lb.
- C = effective (buoyed) weight of BOP (subsea stack) in sea water, lb.

**Round Trip:** \( TM = T_r \)

**Half Trip:** \( TM = \frac{1}{2} \times T_r \)

### Ton Miles for Running Riser

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riser Joint Length</td>
<td>50.00</td>
<td>ft</td>
</tr>
<tr>
<td>Weight /joint</td>
<td>152.00</td>
<td>2: 0.00</td>
</tr>
<tr>
<td>Riser Length</td>
<td>2000</td>
<td>2: 0.00</td>
</tr>
<tr>
<td>BOP/Stack Weight</td>
<td>300000</td>
<td>lb</td>
</tr>
<tr>
<td>Sea Water Density</td>
<td>8.50</td>
<td>ppg</td>
</tr>
<tr>
<td>Buoyancy Factor</td>
<td>0.870</td>
<td></td>
</tr>
<tr>
<td>Traveling Block</td>
<td>120000</td>
<td>lb</td>
</tr>
</tbody>
</table>

**Ton Miles**

- **Round Trip:**
  - Ton Miles: 120.58
- **Half Trip:**
  - Ton Miles: 60.29
## CAPÍTULO 13

### Ton Miles Control

Control the ton miles calculations for operational sequence in the oil field.

**Note:**

The following sequences are just for explanation to show the results of ton miles calculations for different operations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Depth, ft</th>
<th>Operation</th>
<th>Type</th>
<th>Ton Miles</th>
<th>SF, %</th>
<th>TM to Slp</th>
<th>TM to Cut</th>
<th>On Reel, ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>5000.00</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>2285.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>5000.00</td>
<td>round trip for change bit</td>
<td>Round Trip</td>
<td>382.08</td>
<td>10</td>
<td>382.08</td>
<td>382.08</td>
<td>2285.00</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>6000.00</td>
<td>drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
<td>10</td>
<td>468.92</td>
<td>468.92</td>
<td>2285.00</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16</td>
<td>6000.00</td>
<td>coring 6000 @ 6000</td>
<td>Coring</td>
<td>8.87</td>
<td>10</td>
<td>477.79</td>
<td>477.79</td>
<td>2285.00</td>
</tr>
<tr>
<td>5</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>casing @ 6000</td>
<td>Casing</td>
<td>225.80</td>
<td>10</td>
<td>703.58</td>
<td>703.58</td>
<td>2285.00</td>
</tr>
<tr>
<td>6</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>liner 7&quot; 4000 @ 6000</td>
<td>Liner</td>
<td>371.96</td>
<td>10</td>
<td>1075.64</td>
<td>1075.64</td>
<td>2285.00</td>
</tr>
<tr>
<td>7</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>riser w/ BOP @ 2000</td>
<td>Subsee</td>
<td>132.64</td>
<td>10</td>
<td>1208.18</td>
<td>1208.18</td>
<td>2285.00</td>
</tr>
</tbody>
</table>
1. e-mail screenshot and file in csv text format to import by Numbers, Excel, etc

2. open in... and iCloud Drive shares a file in csv text format to import by Numbers, Excel, etc

Tap and Drag the finger into the table to show other parameters (column) and to show other items (rows)

After editing an item, all items will be recalculated starting on selected item until the last item.
Ton Miles Calculator for iPad

Ton Miles for Tripping

**DRILLPIPE / TUBING**
- Outer Diameter: 5.0000 inches
- Nominal Weight: 19.50 lb/ft
- Stand Length: 93.00 ft

**Mud Weight**: 9.50 ppg  
**Buoyancy Factor**: 0.855

**Traveling Block Assembly**: 120000 lb

**Ton Miles**: 347.35

### Ton Miles

- **Round Trip**: 347.35
- **Half Trip**

### By Name
- Driller: driller

### Date of Operation
- 2015-05-16

### Well Name
- my well

### Well Depth
- 5000.00 ft

### Operation
- Round trip for new bit

### Safety Factor
- 10%

### TM w/ Safety Factor
- 382.08

### Current
- 2 / 7

### Cumulative To Slip
- 382 / 4000

### Cumulative To Cut Off
- 382 / 12000

### Line Length on Reel
- 2285.0 ft

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>round trip for new bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
</tbody>
</table>

---

www.wellcontrol.com.br
### Ton Miles Control

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>Depth, ft</th>
<th>Operation</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14</td>
<td>5000.00</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16</td>
<td>5000.00</td>
<td>round trip for new bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16</td>
<td>6000.00</td>
<td>drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16</td>
<td>6050.00</td>
<td>coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
<tr>
<td>5</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>casing @ 6000</td>
<td>Casing</td>
<td>225.80</td>
</tr>
<tr>
<td>6</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>liner 7' 4000 @ 6000</td>
<td>Liner</td>
<td>371.96</td>
</tr>
<tr>
<td>7</td>
<td>2015-05-17</td>
<td>9200.00</td>
<td>riser w/ BOP @ 2000</td>
<td>Subsea</td>
<td>132.64</td>
</tr>
</tbody>
</table>

#### Inserting an item

For example, select item 4 to insert a **round trip** operation.

<table>
<thead>
<tr>
<th>Date</th>
<th>Operation</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 14, 2015</td>
<td>Coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>Ton Miles</td>
<td></td>
<td>8.87</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>Safety Factor</td>
<td></td>
<td>10 %</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>TM to Slip</td>
<td></td>
<td>477.79</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>TM to Cut Off</td>
<td></td>
<td>477.79</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>Line on Reel</td>
<td></td>
<td>2000.00 ft</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>Well Name</td>
<td></td>
<td>my well</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>Well Depth</td>
<td></td>
<td>5000.00 ft</td>
</tr>
</tbody>
</table>

When tap on insert button, is created a default operation to comment with ton miles = 0 and with date, operation, and by name empty to edit.

After editing an item, all items will be recalculated starting on selected item until the last item.

Select the operation **Tripping** to insert.
Ton Miles Calculator for iPad

**Ton Miles for Tripping**
- **Round Trip**
- **Half Trip**
- 

**f(x)**
- Complete
- Short Trip

**Measured Depth**
- 6000.00 ft

**DP/Tubing**
- **HW**
- **DC**
- **Others**
- **Depth**

**Mud Weight**
- 9.50 ppg

**Buoyancy Factor**
- 0.855

**Traveling Block Assembly**
- 120000 lb

**Ton Miles**
- 426.29

**Ton Miles**
- 426.29

**By Name**
- driller

**Date of Operation**
- 2015-05-16

**Well Name**
- my well

**Well Depth**
- 6000.00 ft

**Operation**
- round trip for coring

**Safety Factor**
- 10%

**TM w/ Safety Factor**
- 468.92

**Cumulative To Slip**
- 938 / 4000

**Cumulative To Cut Off**
- 938 / 12000

**Line Length on Reel**
- 2285.0 ft

**Current**
- 4 / 8

**Item**
<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2015-05-14 starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2015-05-16 round trip for new bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>3</td>
<td>2015-05-16 drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>4</td>
<td>2015-05-16 round trip for coring</td>
<td>Round Trip</td>
<td>468.92</td>
</tr>
</tbody>
</table>
### Ton Miles Control

**Round Trip**
- Round trip for coring

**Ton Miles Control**
- 486.92
- Safety Factor: 10%
- TM to Slip: 937.84
- TM to Cut Off: 937.84
- Line on Reel: 2285.00 ft
- Well Name: my well
- Well Depth: 6000.00 ft

**By**: toolpusher

#### Deleting an item

For example, select item 6 to delete.

**Setting Casing**
- casing @ 6000

<table>
<thead>
<tr>
<th>Date</th>
<th>Depth, ft</th>
<th>Operation</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-05-14</td>
<td>5000.00</td>
<td>starting new reel</td>
<td>Comment</td>
<td>0.00</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>5000.00</td>
<td>round trip for new bit</td>
<td>Round Trip</td>
<td>382.08</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>6000.00</td>
<td>drilling 5000 @ 6000</td>
<td>Drilling</td>
<td>86.84</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>6000.00</td>
<td>round trip for coring</td>
<td>Round Trip</td>
<td>468.92</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>6050.00</td>
<td>coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>9200.00</td>
<td>casing @ 6000</td>
<td>Casing</td>
<td>225.80</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>9200.00</td>
<td>liner 7&quot; 4000 @ 6000</td>
<td>Liner</td>
<td>371.96</td>
</tr>
<tr>
<td>2015-05-17</td>
<td>9200.00</td>
<td>riser w/ BOP @ 2000</td>
<td>Subsea</td>
<td>132.64</td>
</tr>
</tbody>
</table>

After to delete an item, all items will be recalculated starting on selected item until the last item.
### Ton Miles Control

#### 5 / 7

<table>
<thead>
<tr>
<th>Date</th>
<th>Depth, ft</th>
<th>Operation</th>
<th>Type</th>
<th>Ton Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-05-16</td>
<td>6000.00</td>
<td>Coring 6000 @ 6050</td>
<td>Coring</td>
<td>8.87</td>
</tr>
<tr>
<td>2015-05-16</td>
<td>5000.00</td>
<td>round trip for new bit</td>
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</table>

By driller

---

### Adding a New Item

For example, to add a half trip to drilling. After tap on Add button, select **Half Trip** on popover view:

#### Select the Operation

- Round Trip
- Half Trip
- Short Trip
- Drilling
- Coring

**Add**
Check the **Half Trip** option, edit the parameters and tap on the save button:

**Ton Miles Calculator for iPad**

**Ton Miles for Tripping**
- Round Trip
- Half Trip
- Complete
- Short Trip

**Measured Depth**
- 6000 ft

**Mud Weight**
- 9.50 ppg

**Buoyancy Factor**
- 0.855

**Traveling Block Assembly**
- 120000 lb

**Ton Miles**
- 213.15

---

**Ton Miles**
- 213.15
- Half Trip

**By Name**
- driller 3

**Date of Operation**
- 2015-05-18

**Well Name**
- my well

**Well Depth**
- 6000 ft

**Operation**
- half trip for drilling

**Safety Factor**
- 10%

**TM w/ Safety Factor**
- 234.46

---

**Cumulative To Slip**
- 1686 / 4000

**Cumulative To Cut Off**
- 1686 / 12000

**Line Length on Reel**
- 2285.0 ft

---

**Current**
- 8 / 8

<table>
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## Ton Miles Control

### 8 / 8

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By driller 3
About

This app was developed based on our experience. There is no comparison with any other software.

Our goal was to create a low-cost application with the help of experts to share with drilling engineers, technicians, drillers, students and teachers of drilling engineering.

There is no intention to replace the professional softwares.

You can contribute with suggestions for improvements, correcting the translation to english, reporting bugs and spreading it to your friends.

Please visit our support url and see other applications for Oil & Gas for iPhone, iPod Touch, iPhone and Mac.