



# Calibration Kit

## General Instructions

These instructions provide information on the installation, connection and operation of the Calibration Kit for use with SOR® 800 Series pressure products, specifically the 805PT and 805QS. This kit includes an SOR Calibration Interface and SOR Calibration Manager software that allows the user to verify, adjust and re-calibrate a device from scratch to implement turndown and zero offset, or adjust the zero output of a device to account for environmental effects. For the 805QS, the software also allows the user to verify, adjust, and re-calibrate the switch output settings.



The SOR Calibration Manager is economical, proprietary software which is compatible with all Windows XP SP3 or newer operating systems including Windows Vista®, and Windows 7, and Windows 8 operating systems.

## System Requirements

You will need these minimum system requirements to operate the SOR Calibration Manager software:

- Windows XP SP3 or newer operating system.
- Pentium 233-megahertz (MHz) processor or faster (300 MHz is recommended)
- 500MB free hard drive space
- 128MB of system memory (RAM)
- Microsoft®.NET Framework 2.0 or newer (included in installation)
- CD-ROM or DVD-ROM drive or access to the internet for a downloadable installation
- One available USB port, version 1.1 or greater

**NOTE: You will need administrative rights to install this software. If you do not have administrative rights please contact your IT department before you begin.**

*Hardware and software are subject to change without notice.*

*For latest revision of the I/O Manuals, go to [www.sorinc.com](http://www.sorinc.com)*

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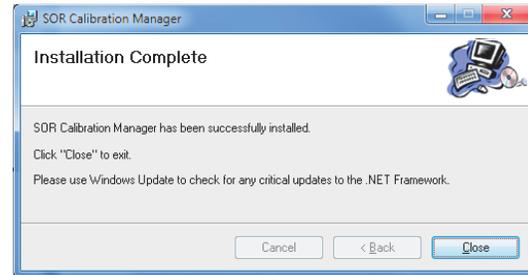
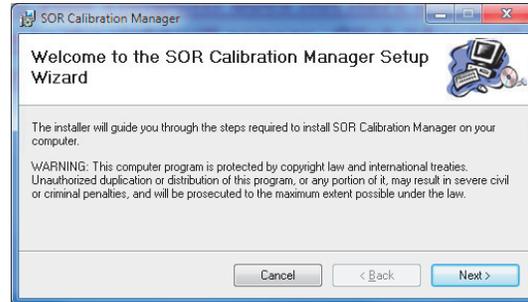
## Software Installation

### INSTALLING FROM CD

Insert the SOR Calibration Manager CD into your CD-ROM or DVD-ROM drive. The installer should automatically start and guide you through the installation process.

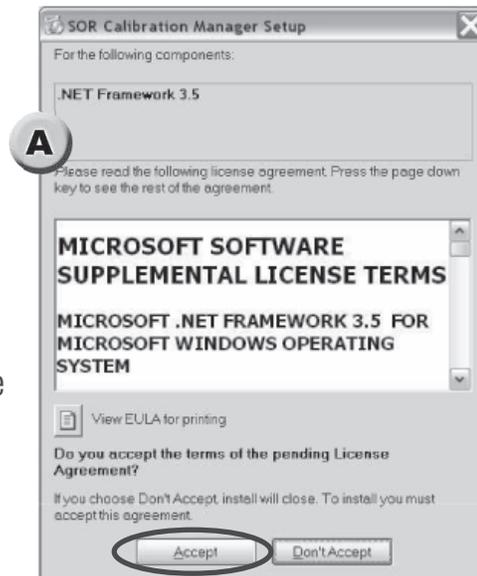
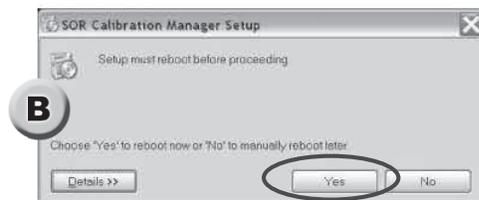
**NOTE:** If the installation does not start automatically, double-click the file **SOR\_Cal\_Mgr.exe**.

After the installation is complete an icon will appear on your desktop.



**NOTE:** If your computer does not have the **Microsoft.NET Framework 2.0** or later installed, window **A** will appear. Click "Accept" to start the **Microsoft.NET Framework** installation. This process could take several minutes.

If prompted to reboot during installation (see **B**), leave the CD in your computer, close all applications, and select "Yes". When the computer reboots, the installer will automatically launch again and finish the installation.



### INSTALLING FROM SOR WEBSITE

Download the SOR Calibration Manager software from [sorinc.com](http://sorinc.com). Under Products, select Pressure Transmitters then Calibration Kit. Click on the word **downloaded**. When download is complete, unzip the folder and double-click the **SOR\_Cal\_Mgr.exe** file to begin installation. After the installation is complete an icon will appear on your desktop.

**NOTE:** If your computer does not have the **Microsoft.NET Framework 2.0** or later installed, window **A** above will appear. Click "Accept" to start the **Microsoft.NET Framework** installation. This process could take several minutes.

If prompted to reboot during installation, close all applications, and select "Yes". When the computer reboots, the installer will automatically launch again and finish the installation.

## INTERFACE SET-UP

- Plug the USB cable into the USB receptacle of the Calibration Interface.
- Plug the other end of the USB cable into a USB port on your computer. You may see a “Found New Hardware” balloon appear in the system tray while the computer installs the driver.
- Do not unplug the Calibration Interface until the driver is finished installing.
- Once the driver is finished installing, your Calibration Interface is ready to use.

**NOTE: The Calibration Interface will power on, at which point, an audible clicking sound will be heard. This is part of the POST (Power-On-Self-Test) of the Calibration Interface.**

## SUPPORTED PRODUCTS

The SOR Calibration Manager supports the following SOR products:

- ① 805PT Pressure Transmitter
- ② 805QS Pressure Switch

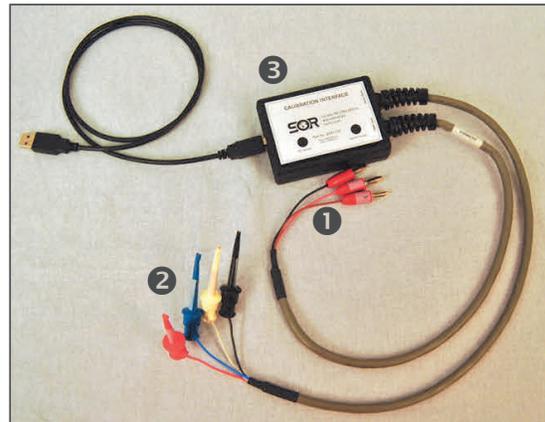
**NOTE: Make certain you are using SOR Calibration Manager software version 4.0.0.0 or greater.**

Unless otherwise noted, all electrical connections and software procedures are identical for these products.

## Electrical Connection

The following steps should be used to connect the Calibration Interface to the product and your PC.

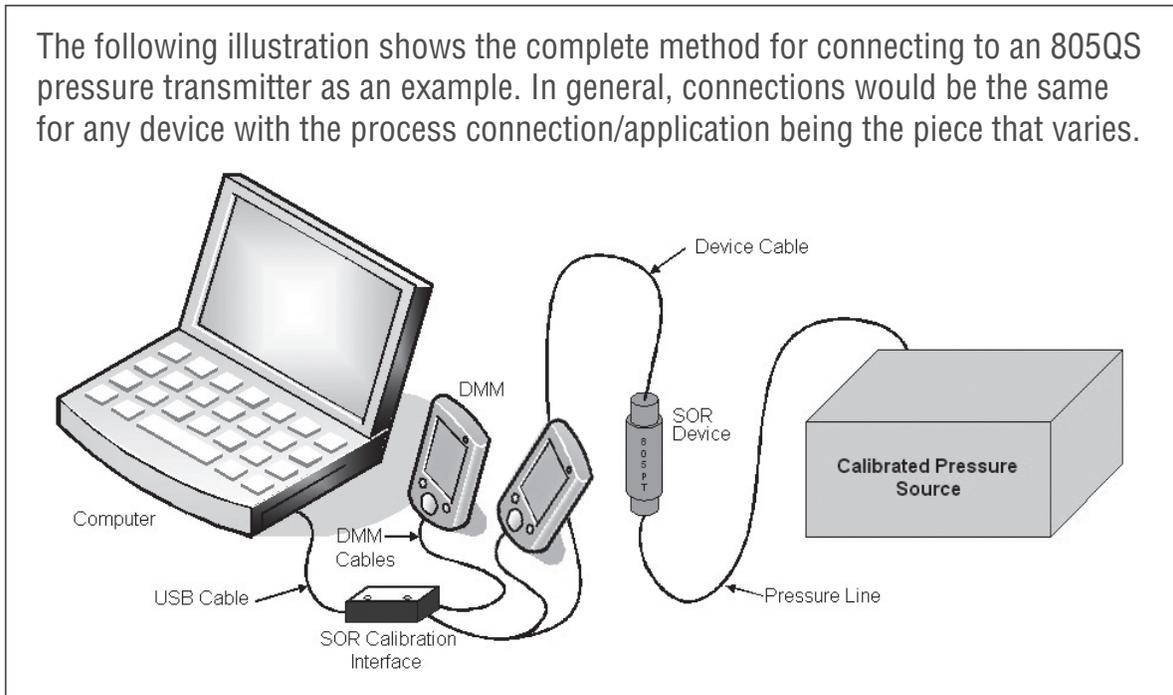
- ① Connect the “DMM Cable” to the DMM (Digital Multi-Meter).
  - “LOW” lead to the DMM “Ground” or “Common” input.
  - “I” lead to the DMM “I” or “Current” or “mA DC” input.
  - “HIGH” lead to the DMM “High” or “Voltage” input. *(required only for 1-5V devices)*
- ② Connect the “Device Cable” to the leads of the device to be calibrated.
  - Black clip lead labeled “(-)” to the black “(-)” wire of the device.
  - Red clip lead labeled “(+)” to the red “(+)” wire of the device.
  - White clip lead labeled “Comms” to the white wire of the device cable.
  - Blue clip lead labeled “V out” to the blue “(1-5VDC Output)” wire of the device. *(required only for 1-5V devices)*



- ③ Connect the Calibration Interface to the PC via the USB cable.
  - Plug the USB cable into the USB receptacle of the Calibration Interface.
  - Plug the other end of the USB cable into an available USB receptacle on the computer.
- ④ For the 805QS, connect a second DMM (Digital Multi-Meter).
  - DMM “Ground” or “Common” input to the yellow wire of the device cable.
  - DMM “HIGH” lead to the orange wire of the device cable.
  - DMM set to measure resistance.

**NOTE: The Calibration Interface will power on, at which point, an audible clicking sound may be noticed. This is part of the POST (Power-On-Self-Test) of the Calibration Interface.**

The following illustration shows the complete method for connecting to an 805QS pressure transmitter as an example. In general, connections would be the same for any device with the process connection/application being the piece that varies.



## Connecting to a Device

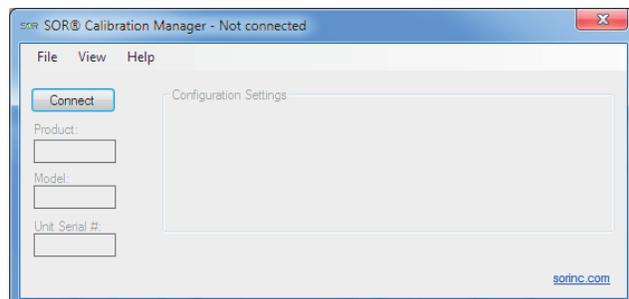
### ① Launch the Software

Begin by launching the SOR Calibration Manager. The Calibration Manager can be launched by double-clicking the icon on your desktop or navigating to the Start menu, Programs > SOR Inc. > SOR Calibration Manager.

**NOTE: It may take a moment for the software to launch the first time.**

### ② Connect to the Device

When the application launches, the main screen will look like the screen shot here. To connect to a device, click the “Connect” button.

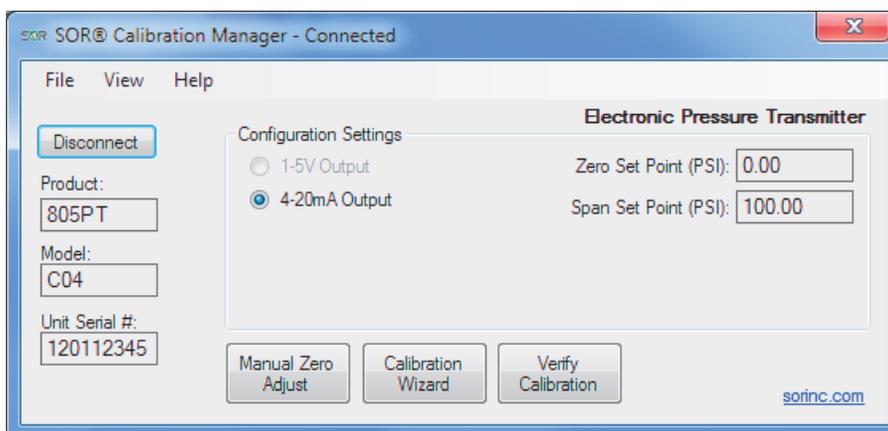


**NOTE: It is recommended to disconnect from a device before you exit the application or unclip/disconnect any Calibration Interface leads.**

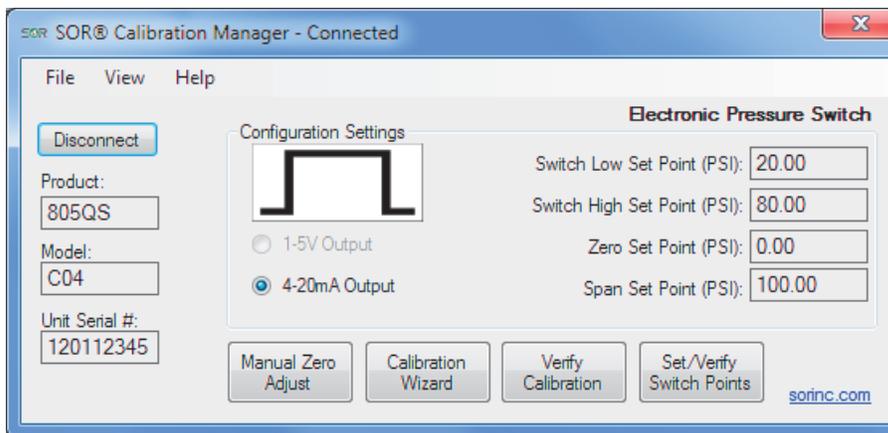
When you have successfully connected to a device, the form title text will show “SOR Calibration Manager – Connected”. The application window will automatically be updated with configuration information about the device, such as the product name, product model, unit serial number, signal output type (4-20mA or 1-5V), and the calibrated Zero and Span Set Points for that device. For the 805QS, the switch output settings will also be displayed.

The main calibration manager window will be displayed differently based on the type of product being calibrated as followed:

805PT  
Pressure  
Transmitter



805QS  
Pressure  
Switch



**NOTE: Units that have been calibrated using a previous version of the SOR Calibration Manager will need to be re-calibrated to display the calibrated Zero and Span Set Points.**

**NOTE: The software will display warnings for 805QS units that have not been previously calibrated on the user's PC. These warnings are not displayed once a unit's switch output has been calibrated or verified.**

## Calibration

To calibrate a device, begin by clicking the “Calibration wizard” button. Simply follow the guided steps to complete the calibration. New Zero & Span Set Points can be entered to re-range the device if needed.

The guided calibration wizard will provide step-by-step instructions on how to calibrate the device. Follow these instructions to guide you through the calibration process.

**NOTE: Take care to ensure the USB cable remains connected during calibration. If the USB cable should become disconnected at any point during the calibration, it may be necessary to exit the Calibration Manager and restart the Calibration Wizard.**

After the first attempt to calibrate a device is completed, the summary screen **C** is displayed to show how closely the device is calibrated to the target settings.

Press the “Next” button to further adjust the Zero and Span Set Points. Once the device is calibrated to a satisfactory precision, press the “Finish” button to complete the calibration.

**NOTE: It may be desirable to save an archive of the device calibration when the device has been calibrated to a satisfactory zero and span output. To do this, press the “Save Report” button. You will be prompted for a directory to save the file. Once the directory is chosen, it will automatically be recalled upon subsequent saves.**

The screenshot shows the 'Calibration parameter entry...' dialog box. It contains the following fields and values:

Calibration parameters	
Zero Set Point (PSI):	0.00
Span Set Point (PSI):	100.00
Turndown Value:	2.5:1
Elevated Zero:	0%
Output at zero:	
Output at span:	

Calibration instructions:  
Enter the zero set point and span set point in the input boxes. Then press Next...

Calibration status		
	Zero	Span
Target	4.000mA	20.000mA
As-Read		
% Error		
Model#	805QS-C04	
Serial#	120112345	
Date	12/19/2012	

Comments:

Buttons: Save Report, Next >>, Finish, Cancel

The screenshot shows the 'Calibration parameter entry...' dialog box at a later stage. A callout 'C' points to the 'As-Read' values in the calibration status table. The fields and values are:

Calibration parameters	
Zero Set Point (PSI):	0.00
Span Set Point (PSI):	100.00
Turndown Value:	2.5:1
Elevated Zero:	0%
Output at zero:	4.009
Output at span:	20.130

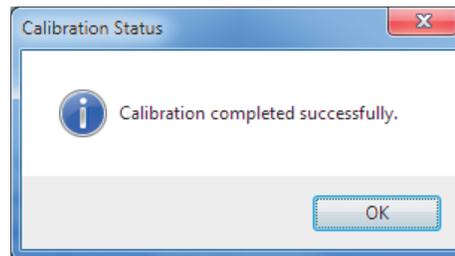
Calibration instructions:  
To further improve this calibration press Next. Otherwise press Finish to finalize the calibration.

Calibration status		
	Zero	Span
Target	4.000mA	20.000mA
As-Read	4.009mA	20.130mA
% Error	0.06%	0.81%
Model#	805QS-C04	
Serial#	120112345	
Date	12/19/2012	

Comments:

Buttons: Save Report, Next >>, Finish, Cancel

After the “Finish” button is pressed, the following confirmation will be displayed to confirm the calibration process was completed successfully.



## VERIFYING THE CALIBRATION

To verify the calibration status of a device, begin by clicking the “Verify calibration” button. Follow the guided steps to complete the verification. If the verification results are not acceptable, start the “Calibration wizard” to either adjust the calibration or re-range the device.

**NOTE:** *It may be desirable to save an archive of the device calibration when the device has been calibrated to a satisfactory zero and span output. To do this, press the “Save Report” button. You will be prompted for a directory to save the file. Once the directory is chosen, it will automatically be recalled upon subsequent saves.*

A screenshot of a software dialog box titled "Checking As-found Readings...". It has a blue header bar with a close button (X) in the top right corner. The dialog is divided into several sections:

- Calibration parameters:** Contains input fields for "Zero Set Point (PSI): 0.00", "Span Set Point (PSI): 100.00", "Turndown Value: 2.5:1", and "Elevated Zero: 0%". To the right, there are output fields: "Output at zero: 3.997" and "Output at span: 20.012".
- Calibration instructions:** Text reads: "Press Save Report to save the calibration summary report, or click Finish to exit the verification wizard..."
- Calibration status:** A table with three columns: "Zero", "Span", and "Target".

	Zero	Span
Target	4.000mA	20.000mA
As-Read	3.997mA	20.012mA
% Error	-0.02%	0.08%
Model#	805QS-C04	
Serial#	120112345	
Date	12/19/2012	
- Comments:** A text area for user input.
- Buttons:** "Save Report", "Next >>", "Finish", and "Cancel".

## 805QS SWITCH CALIBRATION

**NOTE:** This section only applies to the 805QS. - for more specific information on switch operation, please refer to “805QS Electronic Pressure Switch General Instructions,” form G11547.

To calibrate the switch output of a device, begin by clicking the “Set/Verify Switch Points” button. Simply follow the guided steps to complete the switch calibration. New switch set points can be entered to re-range the device’s switch output as desired.

The guided calibration wizard will provide step-by-step instructions on how to calibrate the device’s switch output. Follow these instructions to guide you through the calibration process.

SOR Calibration parameter entry...

Switch calibration parameters

Switch Point Type: Windowed (default)

Switch Low Point (PSI): 20.00

Switch High Point (PSI): 80.00

Switch calibration instructions

Enter the switch low set point and switch high set point in the input boxes. Then press Next...

Switch calibration status

Model#	805QS-C04
Serial#	120112345
Date	12/19/2012
Switch Low (PSI)	0.00
Switch High (PSI)	80.00

Comments:

Save Report Next >> Finish Cancel

**NOTE:** Take care to ensure the USB cable remains connected during calibration. If the USB cable should become disconnected at any point during the calibration, it may be necessary to exit the Calibration Manager and restart the Calibration Wizard.

After calibrating the device’s switch output, the following summary screens are displayed based on the calibrated switch type.

Switch Type:  
Windowed

SOR Calibration parameter entry...

Switch calibration parameters

Switch Point Type: Windowed (default)

Switch Low Point (PSI): 20.00

Switch High Point (PSI): 80.00

Switch calibration instructions

Press Finish to finalize the calibration.

Switch calibration status

Model#	805QS-C04
Serial#	120112345
Date	12/19/2012
Switch Low (PSI)	20.00
Switch High (PSI)	80.00

Comments:

Save Report Next >> Finish Cancel

Switch Type:  
Single Point: Opened -> Closed

SOR Calibration parameter entry...

Switch calibration parameters

Switch Point Type: Single Point: Opened -> Closed

Switch Point (PSI): 20.00

Switch calibration instructions

Press Finish to finalize the calibration.

Switch calibration status

Model#	805QS-C04
Serial#	120112345
Date	12/19/2012
Switch Point (PSI)	20.00

Comments:

Save Report Next >> Finish Cancel

Switch Type:  
Single Point: Closed -> Opened

Switch calibration parameters

Switch Point Type: Single Point: Closed -> Opened

Switch Point (PSI): 80.00

Switch calibration instructions

Press Finish to finalize the calibration.

Switch calibration status

Model#	805QS-C04
Serial#	120112345
Date	12/19/2012
Switch Point (PSI)	80.00

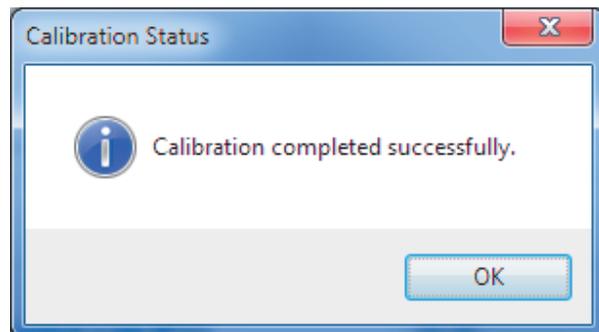
Comments:

Save Report Next >> Finish Cancel

Press the “Finish” button to complete the calibration.

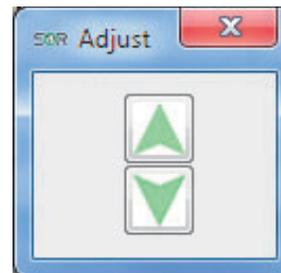
***NOTE: It may be desirable to save an archive of the device calibration when the device has been calibrated to a satisfactory zero and span output. To do this, press the “Save Report” button. You will be prompted for a directory to save the file. Once the directory is chosen, it will automatically be recalled upon subsequent saves.***

After the “Finish” button is pressed, the following confirmation will be displayed to confirm the calibration process was completed successfully.



## Re-Zero Feature

The Manual Zero Adjust feature can be used to adjust the Zero Set Point to compensate for Zero Set Point shifts associated with environmental effects. For example, a pressure transmitter that was calibrated at the Lenexa, KS (USA) factory may read less than 4mA at zero pressure when placed in service at a high-altitude location. To correct this, the output at zero can be adjusted back to the factory calibrated zero output.



***NOTE: In order for the Manual Zero Adjust feature to be enabled for use, the device must be successfully calibrated prior to usage of this feature. If a calibration has been started, but not successfully completed, the Manual Zero Adjust feature will not be available until a successful calibration has been completed.***

## Other Features and Settings

### Changing the Display Units

The display units for the application can be changed to English Units or Metric Units for convenience. To change the display units, go to View on the menu bar and select the preferred display units.

### Obtaining Software Version Information

To view application information regarding SOR Inc., application revision, etc, go to Help on the menu bar and click "About ."

### Warranty

The Calibration Manager software and the Calibration Kit hardware are covered by SOR warranty for six months. For more information please contact Customer Service.





14685 West 105th Street, Lenexa, KS 66215 ■ 913-888-2630 ■ 800-676-6794 USA ■ [SORInc.com](http://SORInc.com)

**12/12** Registered Quality System to ISO 9001

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