Calibration Drift Correction

Bob Salerno

Manager of Project Engineering

2022

Calibration Drift Correction

Calibration drift correction (CDC) is meant to provide more accurate CEMS analyzer data.

Calibration drift correction is a “soft” analyzer adjustment made to the analyzer data by the CEMS PLC. The adjustment is made in the PLC, not in the analyzer itself.

CiSCO uses calibration correction in all projects except for those under South Coast Air Quality Management District (SCAQMD) jurisdiction.

Customers that do not want this adjustment may request to remove it.

Calibration Drift Correction

Calibration correction is used to correct for minor errors in analyzer response found during a calibration check.

Errors may be due to signal transmission and analyzer detector inconsistencies like electronic noise or slight drift.

The assumption is made that analyzer noise will be consistent for a long period of time and the static adjustment will provide accurate compensation until the next analyzer response is evaluated and a new adjustment is made.

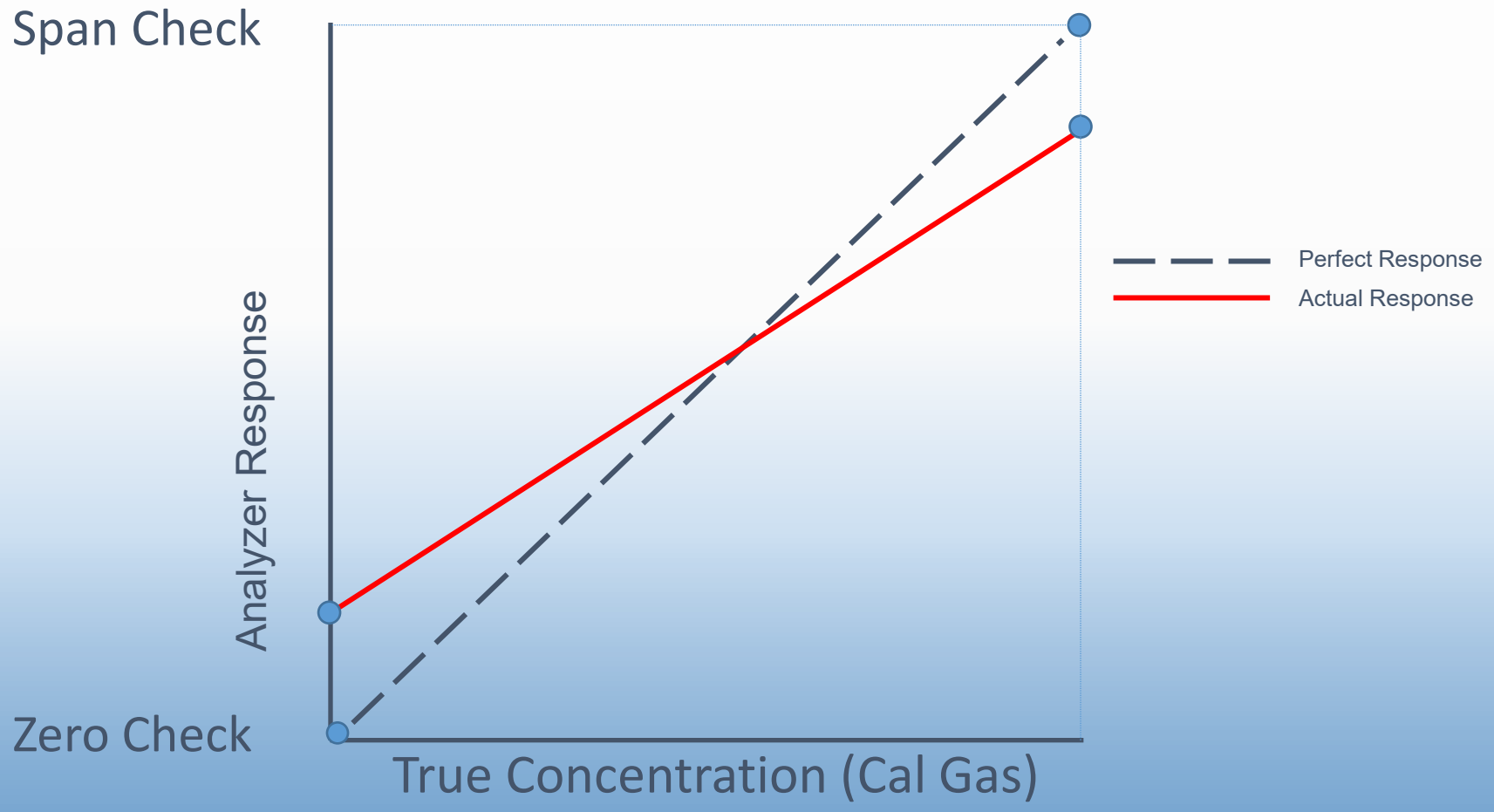
How Does it Work?

The PLC performs the calibration check sequence of an analyzer based on the daily QA requirements using the daily zero and span gases.

This can either be done automatically by the system or initiated manually by a user.

The PLC will detect the drift error measured at both the zero and the span calibration checks.

How Does it Work?



How Does it Work?

The PLC uses the calibration error detected at both the zero and span checks to develop a slope and intercept formula representing the actual response and subtracts it from the slope of the perfect response to determine its correction formula factors.

Corrected analyzer data is sent to the DAHS for reporting.

Caution When Correcting

Each time a calibration check occurs the system resets itself, so it is looking at the raw data during the calibration check. This prevents the possibility of run-away drift correction

The raw zero and span drift detected during a calibration check is reported as calibration drift. The calibration check result displayed in CeDAR reflects the calibration drift of the raw, uncorrected values.

Caution When Correcting

If an analyzer drifts beyond its allowable regulatory limits, then the analyzer will fail the calibration check.

Calibration drift correction is not applied if the analyzer has failed its calibration check.

User intervention is required to manually adjust the analyzer back within tolerances.

Caution When Correcting

Anytime the analyzer is manually adjusted, a calibration check must be initiated in order to reset the correction formula.

If the analyzer is adjusted and a calibration check is not performed, then the PLC correction formula might result in erroneous analyzer data until the next automatic or manual calibration check is performed.

What do the Agencies Say about CDC

South Coast Air Quality Management District does not allow calibration drift correction.

For Part 75, if you use calibration correction, it must also be used on the quarterly linearity check.

If you are using calibration drift correction at your site, it automatically gets applied to the linearity check data.

Other Considerations

CEMS OIT Panels and RealView interfaces will show both: raw analyzer data and calibration corrected data.

On all systems, the calibration correction function can be removed by placing the CEMS Out of Service.

Other Considerations

Since calibration corrected data will be slightly different from the analyzer faceplate values, be careful to consider this when evaluating or troubleshooting analyzer data.

CiSCO provides analyzer test jacks to confirm the raw data sent from the analyzer to the PLC that can be used to confirm the analyzer faceplate values.

Other Considerations

Do not confuse PLC calibration drift adjustment with analyzer drift **self-adjustment**.

CiSCO does not use analyzer self-adjustment features since it potentially disguises analyzer problems.

Our approach is to have an analyzer tech manually adjust the analyzer, so they have a feel for its behavior.