

Life Expectancy of Major CEMS System Components

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How do we know the Life Expectancy ?

- Estimate based on Analysis of purchase orders for these parts
- General Experience of various groups within our company
- Please let us know from your own experiences

Major Components:

- Analyzers
 - 10-15 Years
 - Major Replacement:
 - NO₂ Converter 3-5 Years
 - CO / SO₂ IR Source 3-5 Years
- Thermoelectric Coolers
 - 10 years
 - Rebuild required for Peltier Element/Insulation
- Refrigeration Coolers
 - 15 Years
 - Thermostat Failures
 - Licensed Tech required for coolant leaks

Major Components:

- Sample Lines

- 10 Years
- Lightning strike may cause failure
- Major failures due to cuts in the jacket/water damage
- Electrical connections may fail when powering on and off for very old lines

- Probes

- 15-25 Years
- Corrosive Environments may see less time

- CEMS Shelter

- 20 + Years
- Rust prevention will help. Shelter trim should be repainted at some point

Major Components What it Takes to Replace:

- Analyzers
 - Older model analyzers required a pressurized sample
 - Newer models require sample at ambient pressure
 - Plumbing Modifications to the CEMS to add a bypass to ambient pressure (drain)
 - Sample Flowmeter modifications: Sample Flow to analyzer may be trimmed from more multiple to just one by adding sample manifold
 - Add Sample Flow Alarm switch

Major Components What it Takes to Replace:

- Analyzers Continued
 - Newer models have dedicated analog outputs for each active range.
 - Analyzer range change function/relays will be removed.
 - Choice of current or voltage analog signals
 - CiSCO will add analyzer fault alarm if replaced analyzer did not have one.
 - Software updates will be needed
 - PLC updates may include adding the high range analog input/removing range change functionality
 - May require adding an Analyzer Fault Alarm
 - Updating CeDAR and OIT panels for new fault signals, change in terminology
 - Field Work
 - Expected to take a day per shelter
 - One day for testing and verifying calibration checks
 - Option to add a day of Analyzer Training.

Major Components What it Takes to Replace:

- Thermoelectric Coolers
 - When replacing a CiSCO water bath with a thermoelectric cooler considerations:
 - The connection point of the T/E Cooler is higher than the water bath, and the sample line may have to rise up from the bulkhead to connect. To avoid this, a new penetration in the bulkhead or shelter wall might be needed.
 - Field work expected to take a day per shelter

Major Components What it Takes to Replace:

- Sample Lines
 - Replacing a Technical Heaters line with another Technical Heaters line is a direct replacement and only requires simple electrical and pneumatic terminations.
 - Replacing a sample line with either a Thermon or Ametek/O'brien sample line requires more effort
 - These lines are bulkier and have larger diameter.
 - Larger Penetrations for the Probe Box and Shelter bulkhead may be required
 - Electrical terminations a little more complex.

Major Components What it Takes to Replace:

- Sample Lines
 - Thermon or Ametek/O'Brien lines operate on single phase power, so a Power Breaker replacement may be needed.
 - These lines have restrictions regarding self-limiting control, and temp controllers are likely required.

Questions and General Discussion