

Source Test Engineering
Paperless Chart Recorder Checklist

As of March, 2001, a RECLAIM rule amendment has allowed facilities to use paperless chart recorders in place of a 10-inch paper strip chart recorder. Below is a checklist written to guide facilities in the selection and implementation of a paperless recorder.

1. The paperless chart recorder (PCR) shall record data at the same or greater frequency as the DAS takes in raw data from the analyzer or monitor. If that frequency is greater than once per minute, then the PCR shall record data at once every minute.
2. The PCR shall be installed in the same configuration as the original paper chart recorder (not applicable to new applications). The PCR must be connected in parallel with the DAS, with inputs directly fed from each of the analyzers.
3. The PCR shall continuously archive the data on either directly to a "write once-read many" medium (e.g. CD-R), or in encrypted format to non-volatile data storage. Encrypted means that the data cannot be read except by the use of decryption software. Non-volatile data storage means that the data will not be lost if a power outage occurs.
4. Encrypted files shall be such that they cannot be changed without destroying the files or leaving signs of tampering.
5. Decryption software shall be a commercially available product, not a custom software written only for this application.
6. The decryption software shall be provided upon request (at no cost) to the AQMD. Decryption software enables the user to view the data on a PC as if it were a strip chart and to print the chart (equivalent to a paper strip chart) to a standard PC printer.
7. Conversion software shall be provided upon request (at no cost) to the AQMD. Conversion software enables the user to convert the graphical data to numeric data in a standard output, such as ASCII or Excel, to facilitate calculations.
8. The data shall be viewable on the PCR in the same manner as if it were a paper strip chart recorder (i.e. it must have a screen w/ reasonable resolution).
9. The PCR shall have an integrated real-time clock, accurate to within one minute, and each data point shall include a "date and time stamp", and any printout of a chart shall include time stamps periodically, including the month, day, year and time of day (hr, min, sec) in local time.
10. The facility shall be able create a chart printout, an encrypted file, or a converted file (Excel, ASCII, etc.) of any past data, up to and including data collected for the current day, upon request without more than a 30 minute wait.
11. Any printout of a chart shall include (and identify) the parameters on the chart.
12. Archived digital data shall be stored and protected in a manner at least equivalent to paper chart storage, and shall be stored in an environment compatible with the archival storage medium chosen.

13. The PCR shall record all configuration changes, including the date and time when the changes occurred.
14. The facility shall have a set protocol that must be approved by the District of how and when to archive to media from internal memory, and if removable media is used for archiving, how staff is alerted to replace media when it is full.
15. The PCR shall have chart annotation capability, and all annotations shall be recorded in the archived data files and displayed when data files are viewed as charts.
16. The PCR shall have auto-recovery protection from power failures (no need to re-boot) without loss of data, and automatically log the time and length of power failure.
17. The facility personnel shall be able to print both the chart image and minute data from any period within the last two years during the site visit from SCAQMD Compliance staff.
18. The PCR shall have the internal capability of directly reporting emission data averaged over one-minute intervals.