

DATABASE FORENSIC ANALYSIS

YOU LI, C: 412-889-4880, YOU.LI@SAGEENVIRONMENTAL.COM

JOE WILWERDING, C: 720-244-9752, JOEW@SAGEENVIRONMENTAL.COM

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BACKGROUND:

LDAR
COMPLIANCE
LIABILITY

BEGINNING IN THE 1980S, EPA CALLED FOR THE IMPLEMENTATION OF LEAK DETECTION AND REPAIR (LDAR) PROGRAMS FOR CONTROLLING FUGITIVE VOC EMISSIONS (I.E., EMISSIONS FROM PIPING COMPONENTS SUCH AS FLANGES, CONNECTORS, VALVES, PUMPS). IN GENERAL, EPA HAS FOUND SIGNIFICANT WIDESPREAD NONCOMPLIANCE WITH LDAR REGULATIONS AND, MORE SPECIFICALLY, NONCOMPLIANCE WITH METHOD 21 REQUIREMENTS. IN 1999, EPA ESTIMATED THAT, AS A RESULT OF THIS NONCOMPLIANCE, AN ADDITIONAL 40,000 TONS OF VOCS ARE EMITTED ANNUALLY FROM VALVES AT PETROLEUM REFINERIES ALONE. THE PENALTY COSTS FOR LDAR NONCOMPLIANCE UNDER THE EPA PENALTY POLICY ARE SIGNIFICANT.

For the purpose of avoiding and/or reducing potential noncompliance, EPA developed capabilities to quickly identify database record compliance issues and has been incorporating this analysis into their LDAR enforcement audits. Recently, EPA also issued Clean Air Act Section 114 information requests specifically for facility LDAR database files that store a detailed account of LDAR program implementation and management, and, as such, contain information that documents noncompliance.

Based on a review of generally applicable requirements, up to 85% of a facility's LDAR compliance liability may be described by the site LDAR database. However, if potential noncompliance is identified by regulatory agencies, such as EPA, additional labor and significant penalty costs for facilities responding to these findings will be generated; and more likely, reviews by internal and/or external counsel will be involved.

OUR SERVICES AND APPROACH:

SAGE'S DATABASE FORENSIC ANALYSIS (DFA™)

EPA database audit findings have higher costs than self-addressed findings. Facilities can minimize their potential liability for LDAR noncompliance by proactively correcting LDAR recordkeeping findings. In addition, it is also a practical, low-cost solution for meeting auditing requirements and demonstrating compliance with LDAR Consent Decrees (CDs). Through Sage's LDAR Database Forensic Analysis (DFA™), millions of CD LDAR compliance points are reviewed in numerous requirement categories, allowing facilities to objectively demonstrate substantial and material compliance.

The DFA™ provides a comprehensive review of the site LDAR recordkeeping system and compliance with LDAR program requirements. By using a backup copy of the database file and information regarding applicable LDAR requirements, the DFA™ performs an independent analysis of the facility LDAR database, similar to database audits performed by EPA.

STEP 1 **ELECTRONIC COPIES**

At the beginning of the DFA™ evaluation, sites provide an electronic backup copy of the facility LDAR database to Sage. The facility also needs to complete an LDAR Applicability Matrix spreadsheet for each facility to assist Sage in understanding site-specific LDAR requirements applicable to each site. Sage coordinates with facility environmental staff during this process to ensure that the required files are transmitted and received.

STEP 2 **INITIAL DFA™ REVIEW**

After electronic copies of the facility LDAR database and additional requested information are obtained, Sage engineers perform in-depth analyses on specific LDAR program requirements. Sage performs a review that spans five years or the period of time requested by the facility. Sage produces a draft DFA™ report including a description of the query work performed, as well as the query results for each requirement tested.

STEP 3 **DISCUSSION OF FINDINGS**

After transmitting the report, Sage schedules a conference call with facility representatives to present the potential compliance issues identified, and discusses how the query results might be interpreted by agency inspectors. This proposal assumes one round of exchange between Sage and facility staff to identify any issues with the DFA™ draft report or assumptions used in completing the initial DFA™ analysis.

The DFA™ focuses on analyzing requirements that are frequently the subject of regulatory audits, are the source of frequent noncompliance, and/or represent significant penalty risk under the EPA Clean Air Act (CAA) penalty policy.

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STEP 4 **FINAL REPORT**

A final report for the DFA™ is issued within two weeks of the conference call. Final report contains a summary of the queries performed and lists of potential compliance issues with respect to each requirement described below. These lists are not meant to be definitive areas of noncompliance, but rather areas of concern that regulatory agencies may potentially identify in a database enforcement audit.

The lists of high-compliance-risk requirements provided by Sage include:

- Consent Decree initial repair attempts at 50-200 ppm within required timeframe (if applicable)
- First attempts at repair within required timeframe
- Final repairs or Delay of Repair (DOR) designations completed within required timeframe
- Shutdown repairs completed within required timeframes
- Percent of active inventory monitored each period (potential missed monitoring evaluation)
- Historical LDAR inventory increases and decreases evaluation
- Technician productivity and Method 21 implementation evaluation of components monitored per technician, per hour and per day
- NSPS/HON 3% Difficult to Monitor (DTM) classification
- DTM monitoring completion (at least once per year monitoring requirement)
- NSPS two months no-leak initial valve monitoring analysis
- NSPS 30-day initial valve monitoring analysis; and (12) NSPS/HON follow-up monitoring after leak identification

RECURRING DFAS™

For recurring DFAs, Sage performs the query analysis based on the assumptions and LDAR Applicability Matrix used during the initial DFA™ audit of each facility, accounting for updated process unit shutdown information provided by the site. The recurring DFAs cover the time period since the last DFA™© was performed. Within two weeks of receiving the electronic database backup file from the facility (provided the analyses can be staggered between sites), Sage provides a recurring DFA™© audit report via email with the query results for each requirement tested. Identification of improvements in facility recordkeeping performance between DFAs are included in this report.

OUR SERVICES AND APPROACH:

SAGE'S DATABASE FORENSIC ANALYSIS (DFA™)

DFA QUERY TOOL™

A part of our DFA™ review service involves using Sage's DFA Query Tool™. This tool puts the power of an independent compliance review into the facility's hands, and allows clients to self-monitor LDAR program implementation on an ongoing basis.

After the initial DFA™ evaluation, Sage configures and installs the DFA Query Tool™ at the site for ongoing database records analysis, performed by site LDAR program QA/QC personnel. The DFA Query Tool™ can be used by facility LDAR coordinators/managers to add robustness to the site or corporate QA/QC program, to focus available QA/QC resources on agency-important compliance areas, and to keep LDAR coordinators and corporate compliance managers on top of the program by quickly evaluating key program parameters. This allows DFA™ to be performed before the end of each compliance period to catch missed monitoring and repairs before noncompliance occurs. Corporate managers can also use the DFA Query Tool™ to quickly identify significant LDAR program compliance liabilities, evaluate compliance patterns within the company or specific sites, identify outlier interpretations and compliance issues, trend performance, and identify LDAR resource needs.

In addition, the DFA Query Tool™ can be custom-developed as a corporate dashboard for oversight of multiple sites. Developed in this fashion, corporate managers connect "real time" to site databases on the company servers to monitor individual facility compliance or compare LDAR performance between sites. Performance is presented on a normalized basis, such as number of compliance issues identified versus total number of compliance points reviewed at a site, in order to accurately compare program performance. Performance data is tracked to chart comparisons and compliance improvement over time.

Sage also develops custom queries based on specific compliance, QA/QC, or LDAR program management issues important to the facility. We are also available to work with the company IT department to develop other custom DFA™ solutions for facility operations, such as BWON compliance.