



Electronic Data Evaluations



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Overview

- ❖ Why are electronic data evaluations (EDEs) important right now?
- ❖ What do I need to do them?
- ❖ Where should I look for problems?
- ❖ How do I get started?



Why important now?

- ❖ Widespread electronic data collection by industry
 - ❖ CEMS data
 - ❖ Process Information (PI) data
 - ❖ Other
 - Specific compliance databases (LDAR, other?)
 - Specific software applications (SAP, workflow, custom)



What do you need?

- ⊕ Knowledge of databases
 - ⊞ Data types, conversion tools
 - ⊞ Query development skills
- ⊕ Knowledge of specific environmental requirements
- ⊕ Troubleshooting skills to identify relevant data sources and connect them appropriately to isolate instances of noncompliance



Where should I look for problems?

- ☛ Case studies (easy to harder)
 - ☛ CEMS evaluation: incinerator stack 3-hr VCM limit exceedences
 - ☛ CEMS evaluation: isolating temperature exceedences (w/o 180 min avg)
 - ☛ LDAR data: missed first attempts at repair
 - ☛ Permit requirements: failure to operate pollution control equipment with operating source



Case Study 1: CEMS Evaluation

- ❖ Requirement: maintain 3-hr, average stack VCM concentration below 10 ppm
- ❖ Available data: 12 million records of plant ambient/stack VCM conc. Data (minute-data)
- ❖ Solution: 1) filter records to only stack data, 2) average data over each hour, 3) filter to include only hourly concentrations ≥ 10 ppm



Case Study 1: CEMS Evaluation Solution

Incinerator Hourly VCM Avgs \geq 10 ppm

| Location | Date | Hour | AvgConcPPM |
|----------------|-----------|------|---------------|
| Incinerator #1 | 2/14/2003 | 10 | 55.77 |
| Incinerator #2 | 2/14/2003 | 10 | 182.90 |
| Incinerator #1 | 4/27/2001 | 10 | 19.07 |
| Incinerator #1 | 8/6/2001 | 21 | 15.17 |
| Incinerator #2 | 1/27/2001 | 2 | 13.10 |
| Incinerator #2 | 3/22/2001 | 12 | 81.50 |
| Incinerator #2 | 4/14/2001 | 13 | 13.15 |
| Incinerator #2 | 4/25/2001 | 4 | 11.92 |
| Incinerator #2 | 4/27/2001 | 10 | 11.65 |
| Incinerator #2 | 7/13/2001 | 4 | 20.27 |
| Incinerator #2 | 7/13/2001 | 5 | 10.70 |
| Incinerator #2 | 8/6/2001 | 21 | 15.22 |



Case Study 2: CEMS Evaluation

- ❖ Requirement: maintain kiln exhaust gas temp below performance test limit
- ❖ Available data: minute, CEMS/PI temp data; temp limits from performance tests
- ❖ Solution: 1) enter performance test limits and relevant date ranges into data table, 2) link CEMS data to limit data based on date info



Case Study 2: CEMS Evaluation Solution

KilnBaghouseTempLimits : Table

| LimitID | KilnBaghouse# | LimitDegF | EffectiveDateStart | EffectiveDateEnd |
|---------|---------------|-----------|--------------------|------------------|
| 1 | 1 | 409 | 6/14/2002 | 9/23/2003 |
| 2 | 2 | 422 | 6/14/2002 | 9/15/2003 |
| 3 | 3 | 368 | 6/14/2002 | 9/19/2003 |
| 4 | 4 | 460 | 6/14/2002 | 9/13/2003 |
| 5 | 5 | 436 | 6/14/2002 | 9/13/2003 |
| 6 | 6 | 585 | 6/14/2002 | 9/16/2004 |
| 7 | 7 | 569 | 6/14/2002 | 12/8/2004 |
| 8 | 4 | 445 | 6/14/2002 | 6/14/2003 |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |

KilnBHTempExceedances : Select Query

Kiln3HrRollAvgBHTemps

- ID
- DateTime
- KilnBaghouse#
- 3HrRollAvgTemp

KilnBaghouseTempLimits

- LimitID
- KilnBaghouse#
- LimitDegF
- EffectiveDateStart
- EffectiveDateEnd

| Field: | DateTime | KilnBaghouse# | 3HrRollAvgTemp | DateTime |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|---|
| Table: | Kiln3HrRollAvgBHTe | Kiln3HrRollAvgBHTe | Kiln3HrRollAvgBHTe | Kiln3HrRollAvgBHTemps |
| Sort: | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | | | >[LimitDegF] | Between [EffectiveDateStart] And [EffectiveDateEnd] |
| or: | | | | |



Case Study 3: LDAR Data

- ❖ Requirement: make a first attempt at repairing leaks within 5 days of identification
- ❖ Available data: FEMS database software for the facility LDAR program
- ❖ Solution: 1) filter monitoring data to only identified leaks, 2) connect recordset from (1) to repair data, 3) compare original leak date to repair attempt dates to identify compliant repairs, and 4) isolate records from (1) which are not present in the recordset from (3)



Case Study 3: LDAR Data

Solution Step 1

Query K - Leaks : Select Query

| | | | | | | | |
|-----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Field: | LEQUIPMENT | MIREAD | MIREADNO | LAREA | LSUBAREA | MREFNO | MROUTEID |
| Table: | FUTAGS | FUMONIT | FUMONIT | FUTAGS | FUTAGS | FUMONIT | FUMONIT |
| Sort: | | | | | | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | "vlv" | >=500+[MBREAD] | 1 | | | | |
| or: | | | | | | | |



Case Study 3: LDAR Data

Solution Steps 2 & 3

The screenshot shows a Microsoft Access Query Design View window titled "Query L1 - FirstAttemptIn5Days : Select Query". It displays a relationship between two tables: "FUMONIT" and "Query K - Leaks".

Table: FUMONIT

- * (Primary Key)
- MREFNO
- MROUTEID
- MRUNID
- MIREADNO

Table: Query K - Leaks

- * (Primary Key)
- LEQUIPMENT
- LAREA
- LSUBAREA
- MREFNO
- MROUTEID

The relationship is shown as a line connecting the primary key of "Query K - Leaks" (MREFNO) to the MREFNO field in "FUMONIT".

Field List:

| Field: | LeakDate: MDATE | MADATE | MREFNO | MROUTEID | MRL |
|-----------|-------------------------------------|--|-------------------------------------|-------------------------------------|-----|
| Table: | Query K - Leaks | FUMONIT | FUMONIT | FUMONIT | FUM |
| Sort: | | | Ascending | | |
| Show: | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Criteria: | | >=[Query K - Leaks].[MDATE] And <([Query K - Leaks].[MDATE]+6) And Is Not Null | | | |
| or: | | | | | |



Case Study 3: LDAR Data

Solution Step 4

Query L2 - LeaksWithoutFirstAttemptIn5Days : Select Query

Query K - Leaks

- *
- LEQUIPMENT
- LAREA
- LSUBAREA
- MREFNO
- MROUTEID

Query L1 - FirstAttemptIn5Days

- *
- MREFNO
- MROUTEID
- MRUNID
- MIREADNO
- MOPID

| Field: | MREFNO | MREFNO | MROUTEID | MRUNID | MIREADNO | MOPID |
|-----------|--------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Table: | Query L1 - FirstAttemptIn5Days | Query K - Leaks | Query K - Leaks | Query K - Leaks | Query K - Leaks | Query K - Leaks |
| Sort: | | | | | | |
| Show: | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Criteria: | Is Null | | | | | |
| or: | | | | | | |



Case Study 4: Permit Requirements

- ❖ Requirement: operate baghouses when operating the source of particulate emissions
- ❖ Available data: daily operating reports (Excel), weekly baghouse inspection records (hardcopy), maintenance tracking database (MSAccess)
- ❖ Solution: 1) get all data into Access, 2) identify instances where baghouses not operational, 3) link recordset from (2) to operations data to confirm emissions source was operating, and 4) link recordset from (3) to maintenance data to show no effort made to correct non-operational baghouses



Case Study 4 Solution

| <i>Equip No.</i> | <i>Description</i> | <i>WO Database Equip Desc.</i> | <i>Equip Type</i> | <i>DC No.</i> | <i>Permit No.</i> |
|------------------|------------------------------------|--|-------------------|---------------|-------------------|
| 41-051 | Clinker storage BC19, BC25 BC26 DC | DUST COLLECTOR , NO 1 , INCL FAN: TRANSFER # 5: NORB | DUST COLLECTOR | DC1 | C001708 |

Selected Pressure Drop Readings

| <i>Date</i> | <i>Pressure Drop</i> | <i>Notes</i> | <i>Assoc Proc Area</i> | <i>Area Max Op Hrs</i> | <i>NEIC Comments</i> |
|-------------|----------------------|----------------------------|------------------------|------------------------|--|
| 7/28/2004 | 0 | | Finish Mills | 24 | PD outside recommended range; failure to operate dust collector according to manufacturer recommendations/sound engineering principles |
| 8/5/2004 | 3.5 | | Finish Mills | 24 | |
| 8/9/2004 | 0 | | Finish Mills | 24 | PD outside recommended range; failure to operate dust collector according to manufacturer recommendations/sound engineering principles |
| 8/18/2004 | | REBAGGING | Finish Mills | 24 | Apparent operation of process equipment without operational control device |
| 8/23/2004 | | NOT WORKING NOT WORKING | Finish Mills | 24 | Apparent operation of process equipment without operational control device |

| <i>WO No.</i> | <i>Type</i> | <i>Description</i> | <i>Comments</i> | <i>Request Date</i> |
|---------------|-------------|---------------------------------------|--|---------------------|
| | | | 11160 AND 11161 MAGNEHELIC GAGE NEEDS REPLACED NEW BAD MATERIAL IS INEFFICIENT AND WE WILL BE GOING BACK TO A BETTER BAG MATERIAL REPORTED BY T. GERMAIN | |
| 11669 | CM | #1 D/C XFER 5 100 PSI GAGE UNREADABLE | 100 PSI GAGE CAN'T BE READ. CHANGES OUT BY T GERMAIN 2-25-04 | 3/3/2004 |
| 12520 | ENV | AQMD QUARTLY INSP D/C CRUSHING | | 5/5/2004 |
| 13029 | GPM | # 1 DC CRUSHING | NEED TO REPAIR MAGNEHELIC. | 6/10/2004 |
| 13830 | ENV | AQMD QUARTLY INSP D/C CRUSHING | | 8/5/2004 |
| 14948 | ENV | AQMD QUARTLY INSP D/C CRUSHING | | 11/5/2004 |
| 16156 | GPM | # 1 DC STORAGE AQMD RESULTS | A & C DAMPERS NEED TO REPAIRED & BAGS ARE NEAR END OF DURATION | 1/23/2005 |



How do I get started?

- Ask for data
- MSAccess training
- Query development training
- Call NEIC