

# **Environmental Management Information System (EMIS):**

## **Getting Your EMS Off the Shelf and Working For You**

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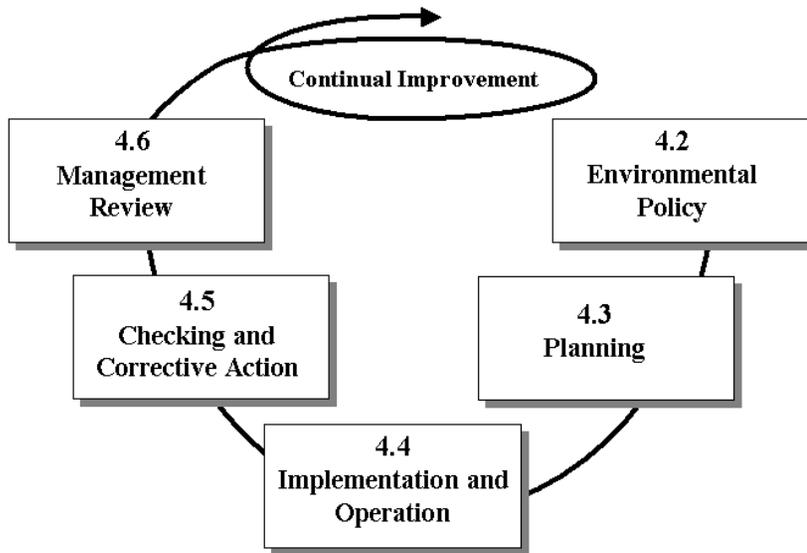
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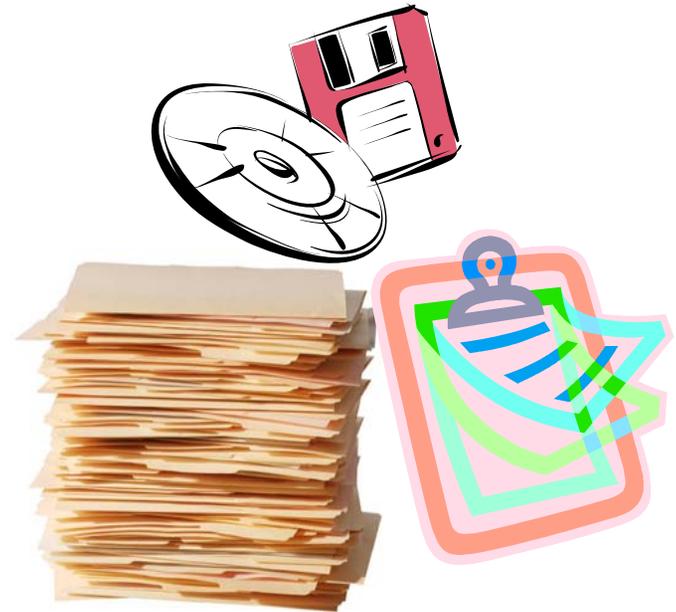


# Problem for Federal Agencies:

Maturity of Commitment: Yes



Maturity of Tools: No

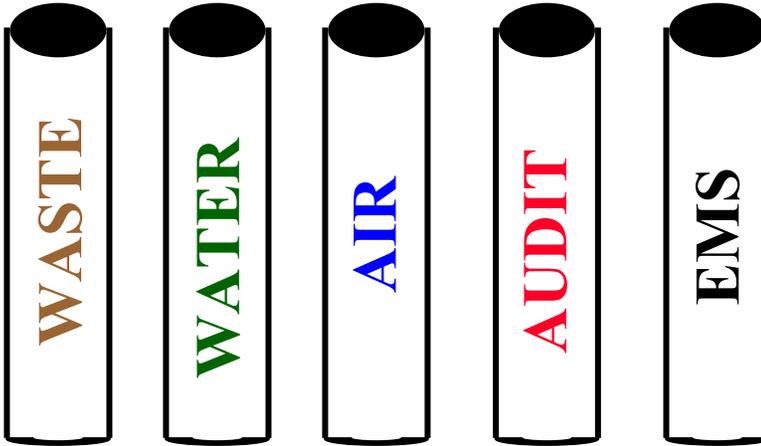


Reality: fragmented programs,  
decentralized data management



# EMS: “Another Rock in My Rucksack”

Environmental Division



For many agencies, EMS is a stove-piped program that does not interact directly with other program areas' information or management goals.

**A disconnected EMS results in:**

**Unmeasurable goals**

**Duplication of effort**

**Fragmented information**



# EMS: High Level vs. “Eaches”



- Too expensive to manage the “Eaches”
- EMS = Sustainability  
EMS ≠ Compliance
- Emphasis on compliance is reactionary



- EMS = Complete management from daily operations on up
- ISO 14001 *requires* compliance, from identification of regulated to auditing
- Sustainability = Requires benchmarking
- You are going to manage the “eaches”, either poorly or well



# Identifying The 'Eaches': The Compliance Connection

4.3.1: Identify environmental aspects +

4.3.2: Identify legal requirements related to aspects +

4.5.2: Evaluate compliance with legal requirements =

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## Tracking and Auditing the Eaches

- Federal Agencies currently identifying regulated environmental aspects as part of compliance assessment program:
  - US Postal Service ECR: 399 Activity-Tasks
  - Navy: 353 Practices (pilot project)
  - Veteran's Health Administration: 883 Activities-Tasks
  - Air Force: 1194 DOEHRS Process Codes
  - Army: 2619 Facility-Activity-Task sets



# Short Answer: Yes

Shop Staff



Other Systems

CEMS, Tank monitors, effluent sampling, etc.



PDA's

Audits, RFID tags, field data-entry



RFID tags

Tanks, drums, meters



EMIS



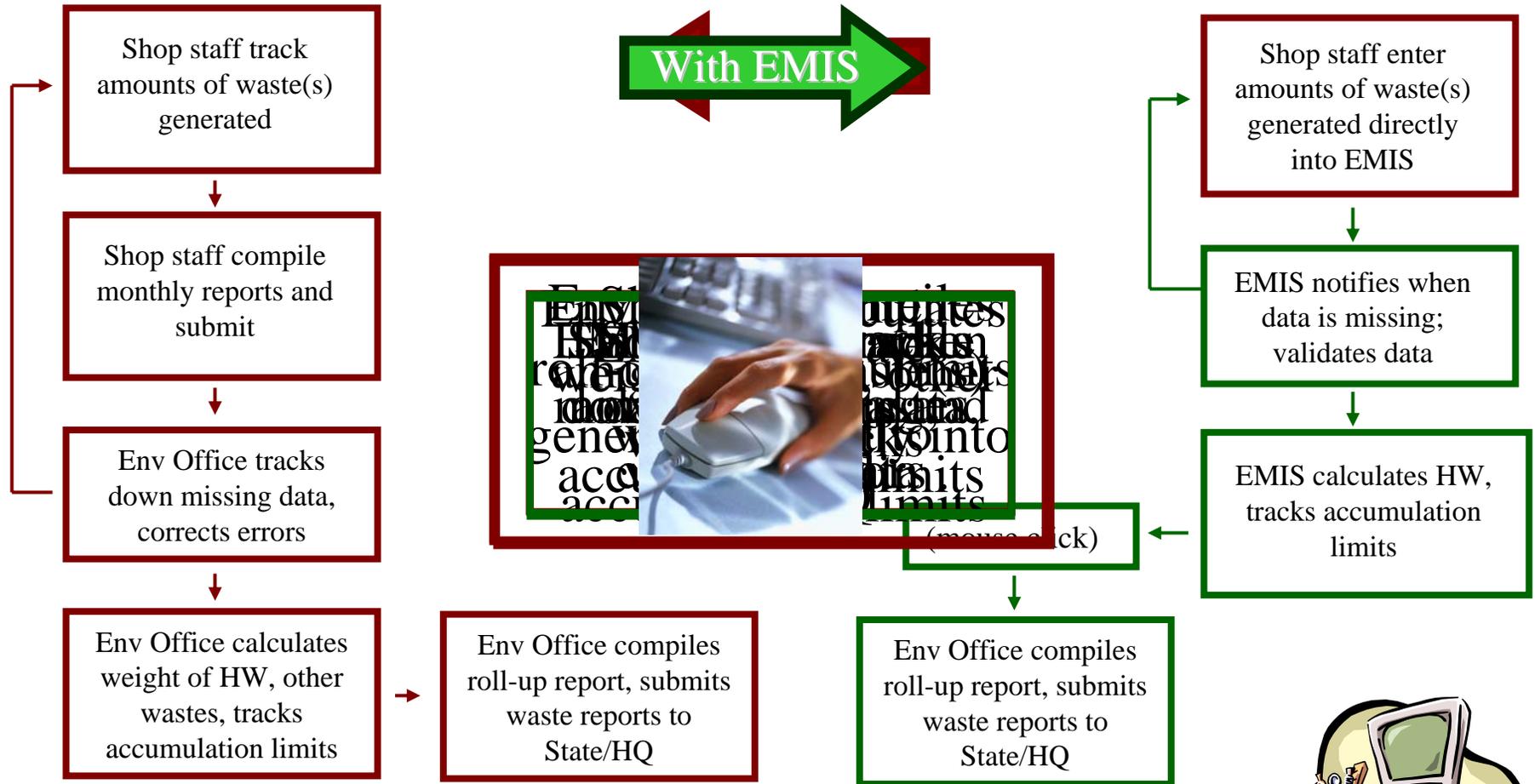
Using modern technology:

- If information has to be routinely collected, processed or analyzed, that process can be automated.
- If a facility or operation has to be inspected, the check process can be automated.
- If data has to be reported, the report process can be automated.



# EMIS: Auto Data Collection

Example: Waste Tracking for a Dispersed Organization



# EMIS: Auto Data Collection

## Details: Waste Tracking

**Organization:** 54 facilities located across State

**Staffing:** Intermittent, subject to interruption

**Requirement:** Monthly/Annual Waste Reports

| <b>Activity</b>                 | <b>Hours Saved Per Action</b>         | <b>Hrs Saved/Yr</b> |
|---------------------------------|---------------------------------------|---------------------|
| Preparing annual waste report   | 32 hours<br>(old: 32 hrs; new: 0 hrs) | 32                  |
| Preparing monthly waste reports | 96 hrs<br>(old: 96 hrs; new: 0 hrs)   | 96                  |
|                                 | <b>Total hours saved per year</b>     | <b>128</b>          |



# EMIS: Auto Data Collection

## Benefits

- Labor savings
- Net-centric: Enter once, use anywhere
- Transcription error reduction
- Timeliness of data entry
- Source of data is clearly identified
- Data consistency (e.g., air toxics inventory and TRI releases)
- Staff morale (professionals do professional level work, rather than data clerking)

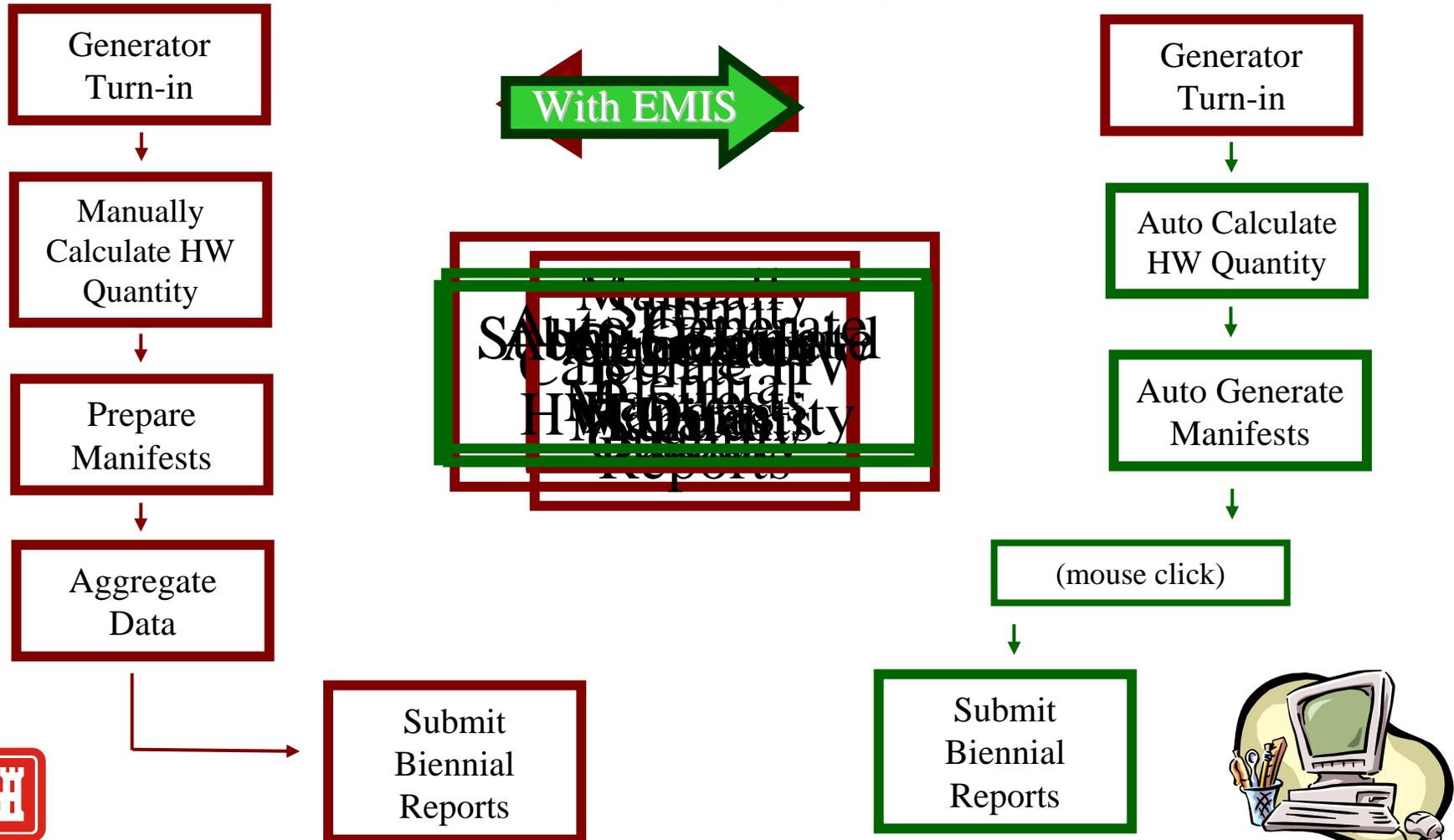
## Examples

- Environmental field measurements (water quality, opacity readings, etc)
- Environmental monitoring devices (CEMS, COMS, tank monitors)
- Inspection data
- Incident recording
- Equipment operating records (hours, flows, fuels, etc)
- Energy and utilities consumption
- Human resource info (Training records, PPE fit, etc)
- Material use records



# EMIS: Auto Report Generation

Example: HW Reporting



# EMIS: Auto Report Generation

## Details: HW Reporting

| Activity                                         | Hours Saved Per Action                                | Hrs Saved/Yr |
|--------------------------------------------------|-------------------------------------------------------|--------------|
| Container Management @<br>540 drums yr           | 45 minutes/drum<br>(old: 60 min; new: 15 min)         | 405          |
| Processing shipment<br>@ 156 shipments/yr        | 2.25 hrs/shipment<br>(old: 3 hrs; new: 45 min)        | 351          |
| Completing Form 1348 /<br>shipment line @ 225/yr | 11.5 min/shipment line<br>(old: 15 min; new: 3.5 min) | 43           |
| Monthly, Quarterly,<br>Biennial Reports          | Approx 6 hrs/report<br>(old: 6 hrs; new: 5 min each)  | 99 hrs       |
| <b>Total hours saved per year</b>                |                                                       | <b>898</b>   |



# EMIS: Auto Report Generation

## Benefits

- Labor savings
- Timeliness of report preparation
- Report accuracy, reduced errors
- Organizational memory (what are my obligations/requirements, where, why, and how do I address them?)
- Extracting “intelligence” from data via filtering, sorting, grouping, etc
- Performance information and comparisons (equipment, individuals, groups, programs, etc)

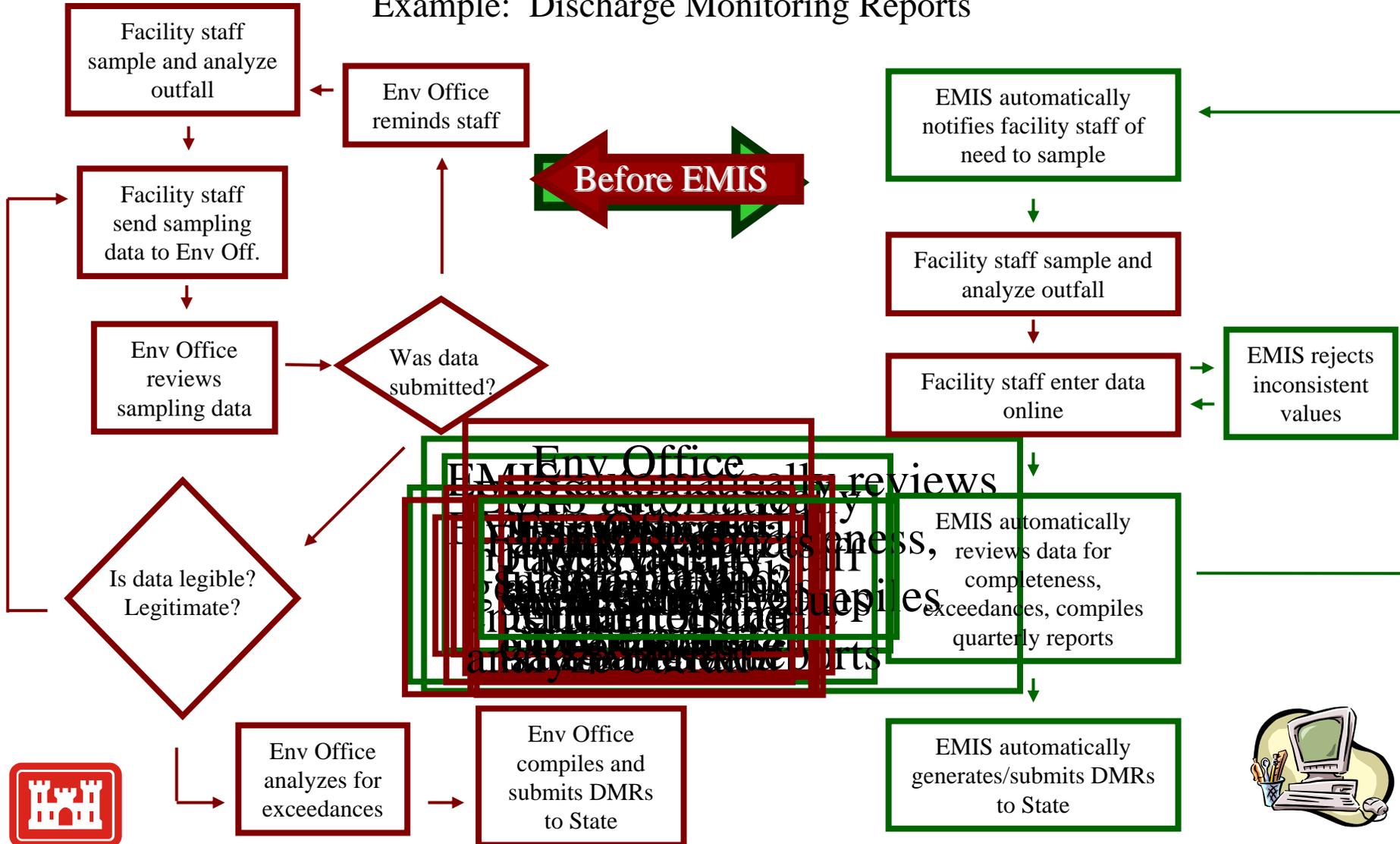
## Examples

- Compliance reports (Title V, NPDES, Haz Waste, TRI, Tier II, etc)
- Inventories (materials, emissions, assets, etc)
- Actions/tasks management
- Identification of training needs, based on performance data



# EMIS: Automated Task Management

Example: Discharge Monitoring Reports



# EMIS: Auto Task Notification

## Details: DMRs

**Organization:** 54 facilities located across State

**Staffing:** Intermittent, subject to interruption

**Requirement:** Monthly/Quarterly Discharge Reports

| Activity                                                   | Hours Saved Per Action                | Hrs Saved/Yr |
|------------------------------------------------------------|---------------------------------------|--------------|
| Tracking down facility information / month / 54 facilities | 30 hours<br>(old: 30 hrs; new: 0 hrs) | 360          |
|                                                            | <b>Total hours saved per year</b>     | <b>360</b>   |



# EMIS: Auto Task Management

## Benefits

- Transparency of actions
- Clear lines of responsibility
- Notifications (ticklers, escalators, warnings)
- Provides useful background info (SOPs, checklists, reference materials, etc)
- Performance measurement and evaluation
- Ties actions/tasks to obligations (what is required) and drivers (regulations, permit conditions, policies, etc)

## Examples

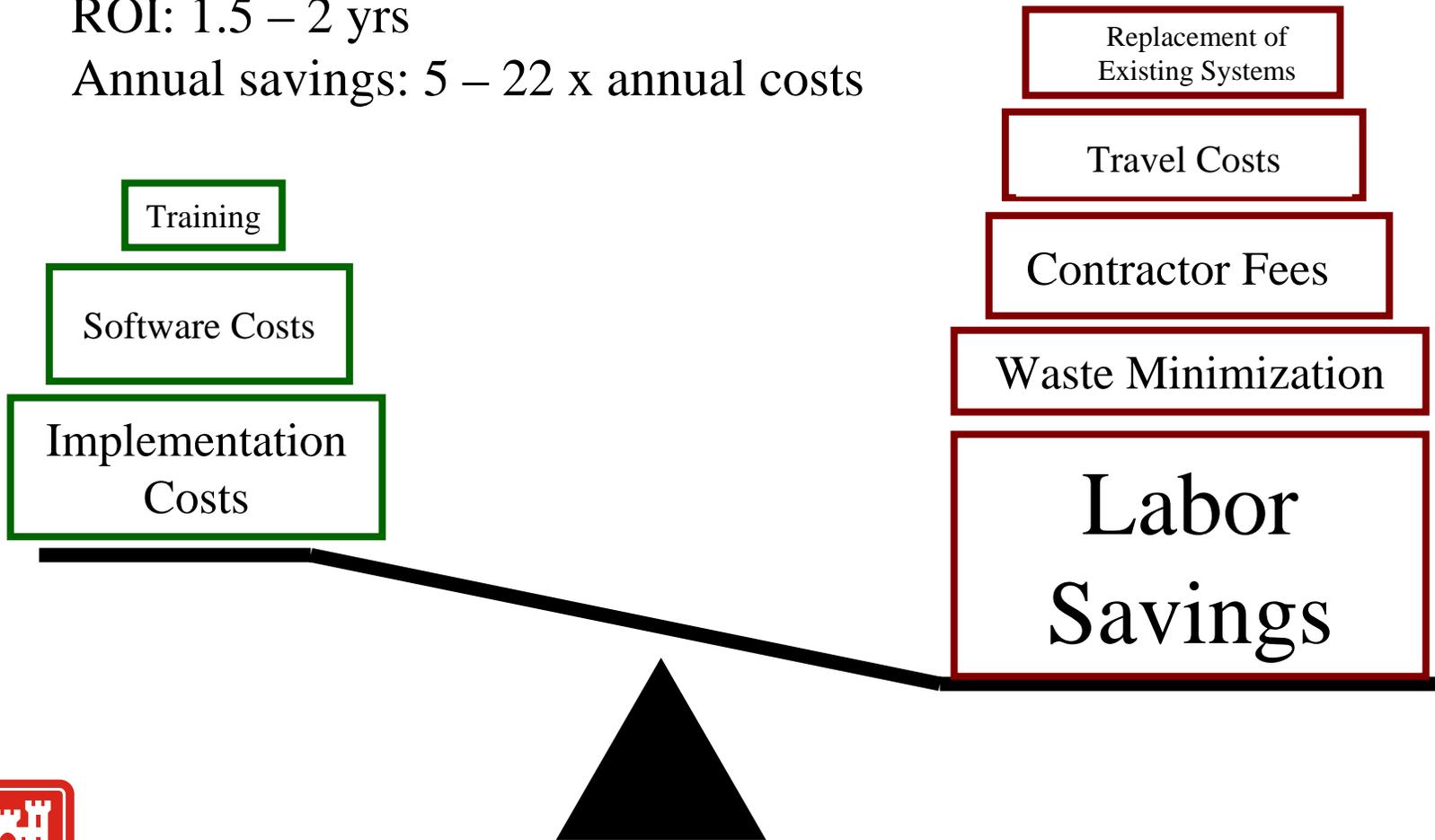
- Compliance with required activities (inspections, observations, etc)
- Manual data entry tracking
- Incident response
- Audits and findings resolution
- Reports submittal
- Maintenance of environmental equipment
- Training tracking and notifications



# Cost / Benefit: Hard Dollar Cost Savings

ROI: 1.5 – 2 yrs

Annual savings: 5 – 22 x annual costs



# Cost / Benefit: Soft Savings

- NOV/NON avoidance
  - Data QA/QC
  - Data availability for decision makers
  - Institutional memory
  - Auditability
  - Data archiving/control
- Reduced reliance on shop personnel
  - Material tracking/waste reduction
  - Monitors thresholds (generator status, etc)
  - “What if?” modeling



# Implementation: Lessons Learned

- Data collection: Largest initial expense, biggest task, worth doing in any case:
  - Contractor support
  - Coordinate with external audit
- Begin with most eager adopters (demonstration), or with ‘orphan’ program (environmental training)
- Training: Focused for most users (learning e-mail)
- Champions: Every EMIS will require one or more ‘power users’ to administer program, develop solutions after implementation phase



# EMIS Impact on the EMS

- EMS benefits from the same data collection, task notification and report automation as any other program
- All full-featured EMIS contain document manager
- Tracks aspects and impacts, facilitates analysis
- Gives ability to set benchmarks, set targets/goals, and to track progress in real-time
- Automates compliance requirements
- Facilitates communication with employees, stakeholders



# Resources\*

- Environmental Management System Software: EMS Software Assessment, March 15, 2004  
<http://corpslakes.usace.army.mil/employees/envcomp/pdfs/ems-assessment.pdf>
- Catalog of EMIS Systems: “EH&S Management Information Systems Report,” Donley Tech, 2007  
<http://www.donleytech.com/emis.htm>
- Seminar on selecting an EMIS:  
<http://trinityconsultants.com/TrainingCategories.asp?tc=38&ts=24>
- Author’s emails:  
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