

Alignment of Environmental Management with Asset Management

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Plant Managers Business
Roundtable

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Houston, Texas

First

Several terms for simplicity

- AM - asset management
- EM - environmental management
- EC - environmental compliance
- ER - environmental response
- CMMS - computerized maintenance management system

Premise

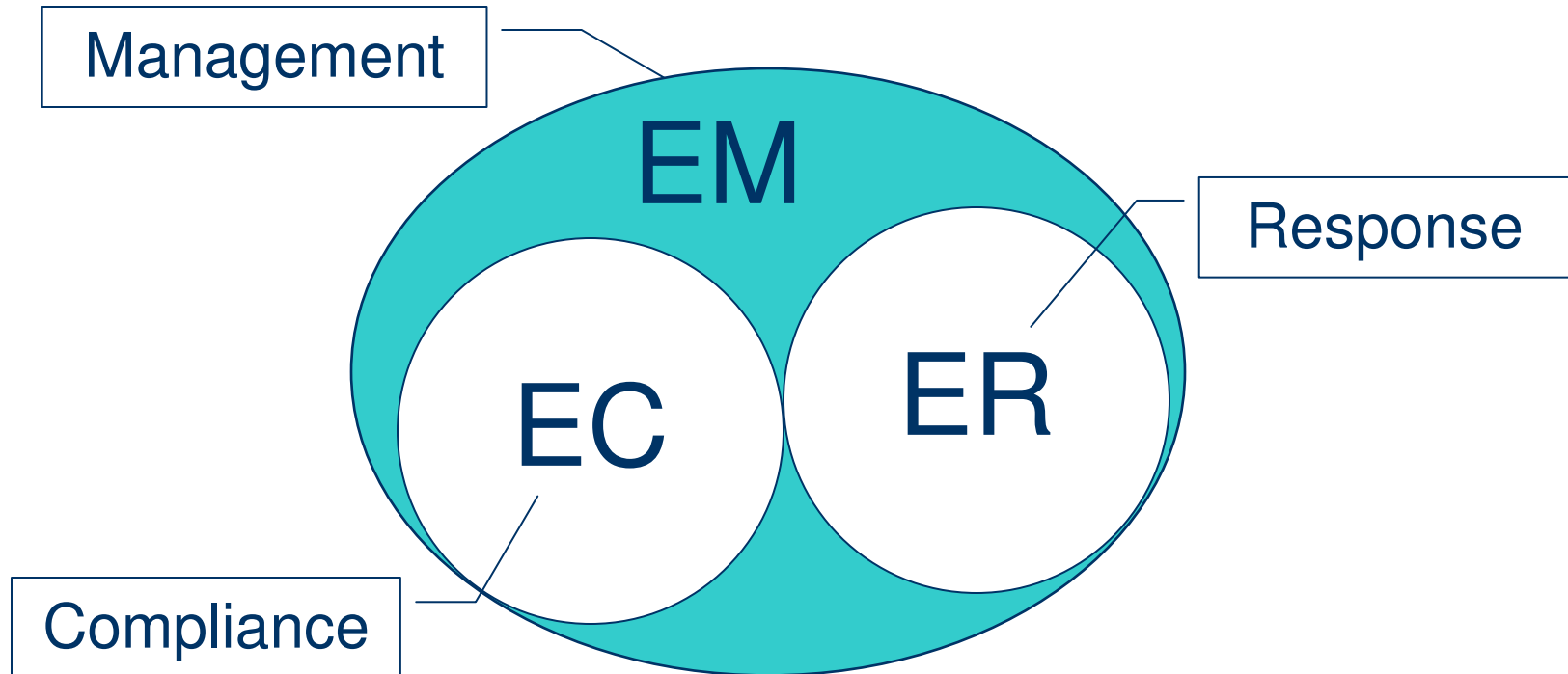
AM paradigm and processes can benefit EM

Typically

EM includes EC and ER

- EC activities establish and maintain *compliance* with regulations and permit requirements
- ER is implemented in *response* to noncompliance events—accidental releases and exceedances

Environmental management



Inherent opportunity

- While EC costs *may not* diminish—because regulatory requirements are not expected to diminish
- ER costs *may* be reduced—by reducing the frequency and severity of noncompliance events

AM

Approach

- Provides framework for making decisions
- Built on objective and quantitative tools
- Incorporating strategic objectives

That

- Preserves facility efficiency
- Avoids unnecessary failures

In particular

AM approach facilitates

- *Preventive* actions before failure
- Avoidance of failure costs

By EM assets

We mean

- Chemicals and oil storage and distribution systems
- Pollutant removal systems

Failure

Occurs in EM systems (tanks, pumps, valves, lines, etc.)—and causes noncompliance

Response-based EM

By default, is operation to failure, i.e., non-action until failure

Discovery of failure

Produces action—implementation of the *response plan*

Failure costs

Include emergency crews, remediation, equipment and material replacement, plant down time, penalties, fines, damaged public relations, etc.

AM paradigm

Shifts focus to analysis of

- Failure potential
- Failure consequences

To enable

- Emphasis on *preventive* management
- Minimization of total (life cycle) costs

Already

Many plants

- Are familiar with AM
- Use CMMS, a component of AM

Most EM software

Focuses on

- Compliance assistance
- Response management
- Remediation

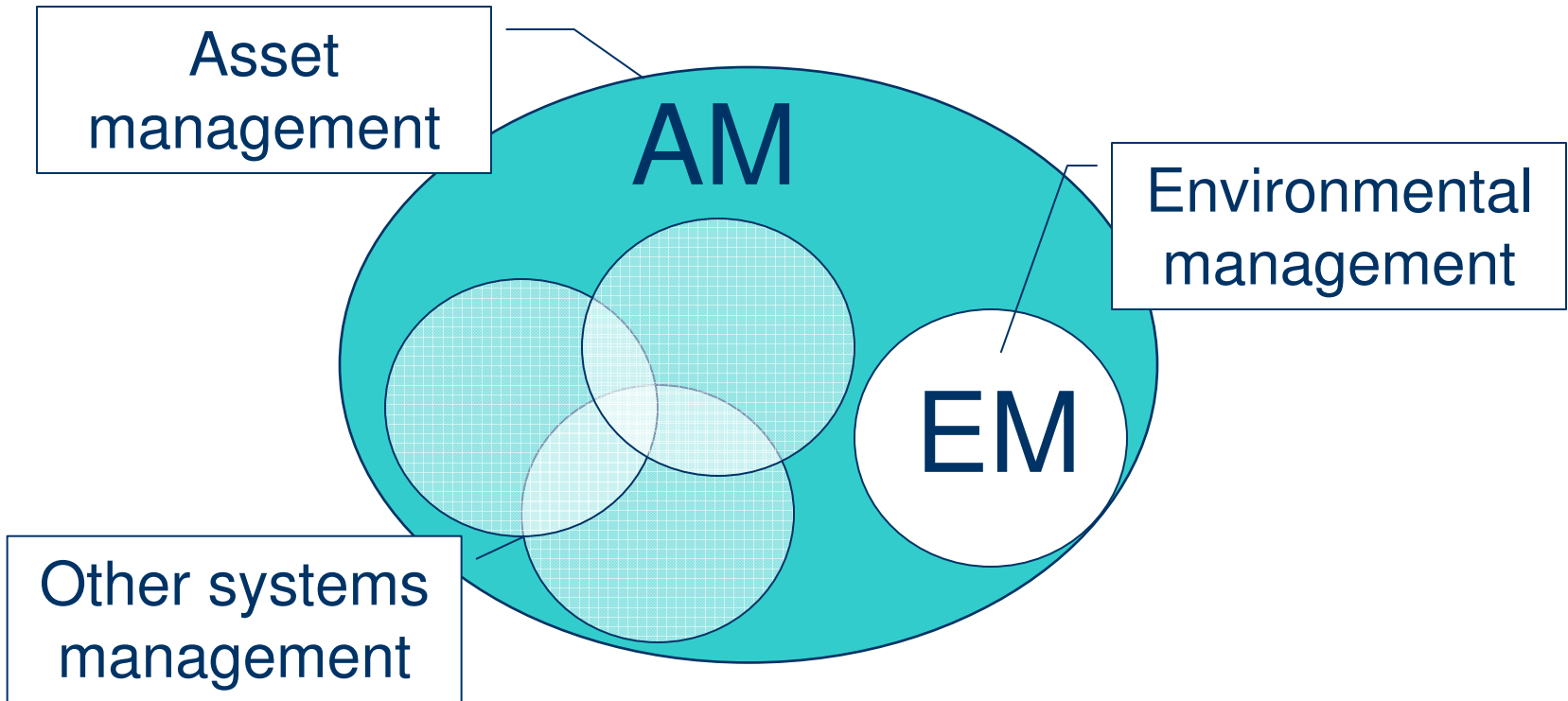
Preventive management support also needed

Next step

Establish *preventive* EM through

- Alignment with AM approach
- Supporting EM software

EM-AM alignment



Importance to Plant Managers

EM-AM alignment can

- Reduce ER costs
- Improve EM asset decision-making, performance, and confidence

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