Safety Culture and Zero leak Commitment

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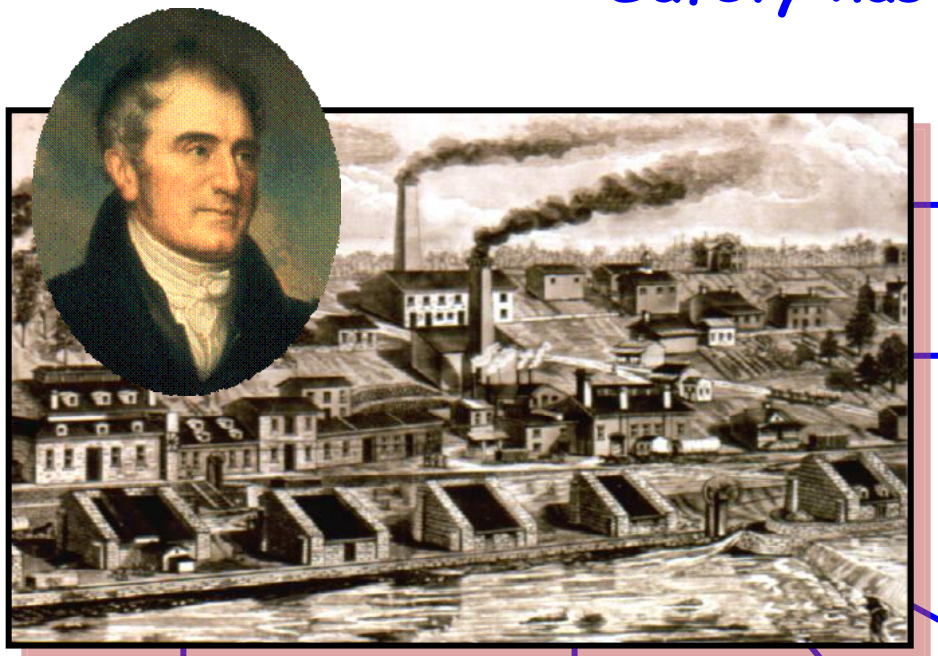
Topics

- The origins of DuPont's Safety culture
- Cultural Elements of the Safety Management System
- Application to Process Safety
- Case study: Zero Leak / Absolute containment

DuPont Safety Culture – History

Safety has become part of our DNA



Powder mill operation began in 1802.

First safety rules established in 1811.

"Safety is a line management responsibility. … No employee may enter a new or rebuilt mill until a member of top management has personally operated it."

– E. I. du Pont

Safety statistics began in 1912.

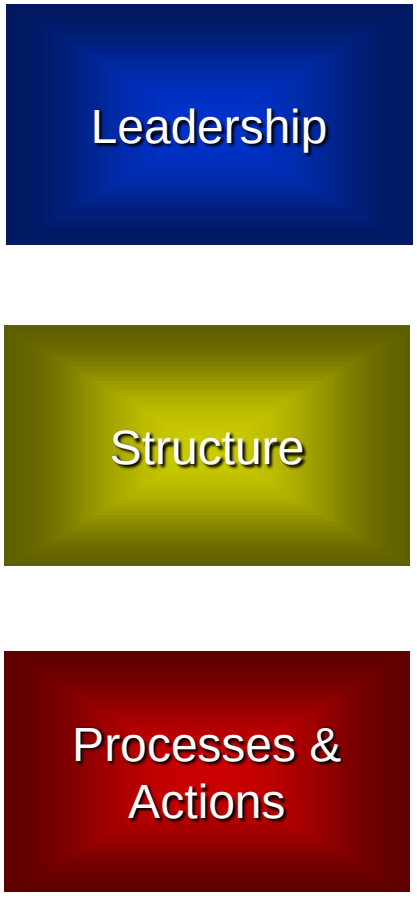
Belief that all injuries are preventable developed in the 1940s.

Off-the-job safety program began in the 1950s.

"Goal is Zero" established in 1990s.

Cultural Elements of our Safety Management System

Leadership is key

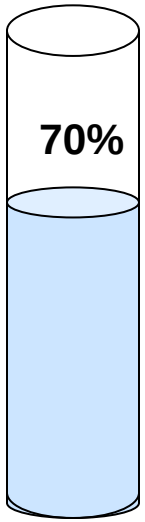


- **Management commitment**
- Policies and principles
- Goals, objectives and plans
- Procedures and performance standards

- Line management accountability and responsibility
- Safety personnel
- Integrated organization structure
- Motivation and awareness

- Incident investigation
- Audits and observations
- Effective communication
- Training and development

Safety Performance is a function of the safety management systems and level of execution



State of Safety Standards

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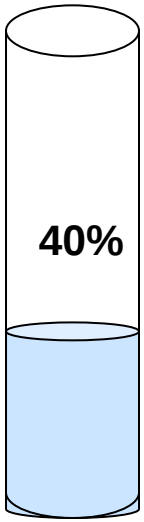

State of Implementation Operational Discipline

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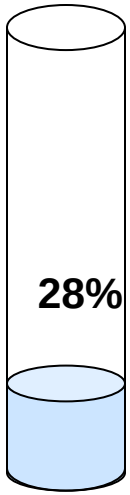
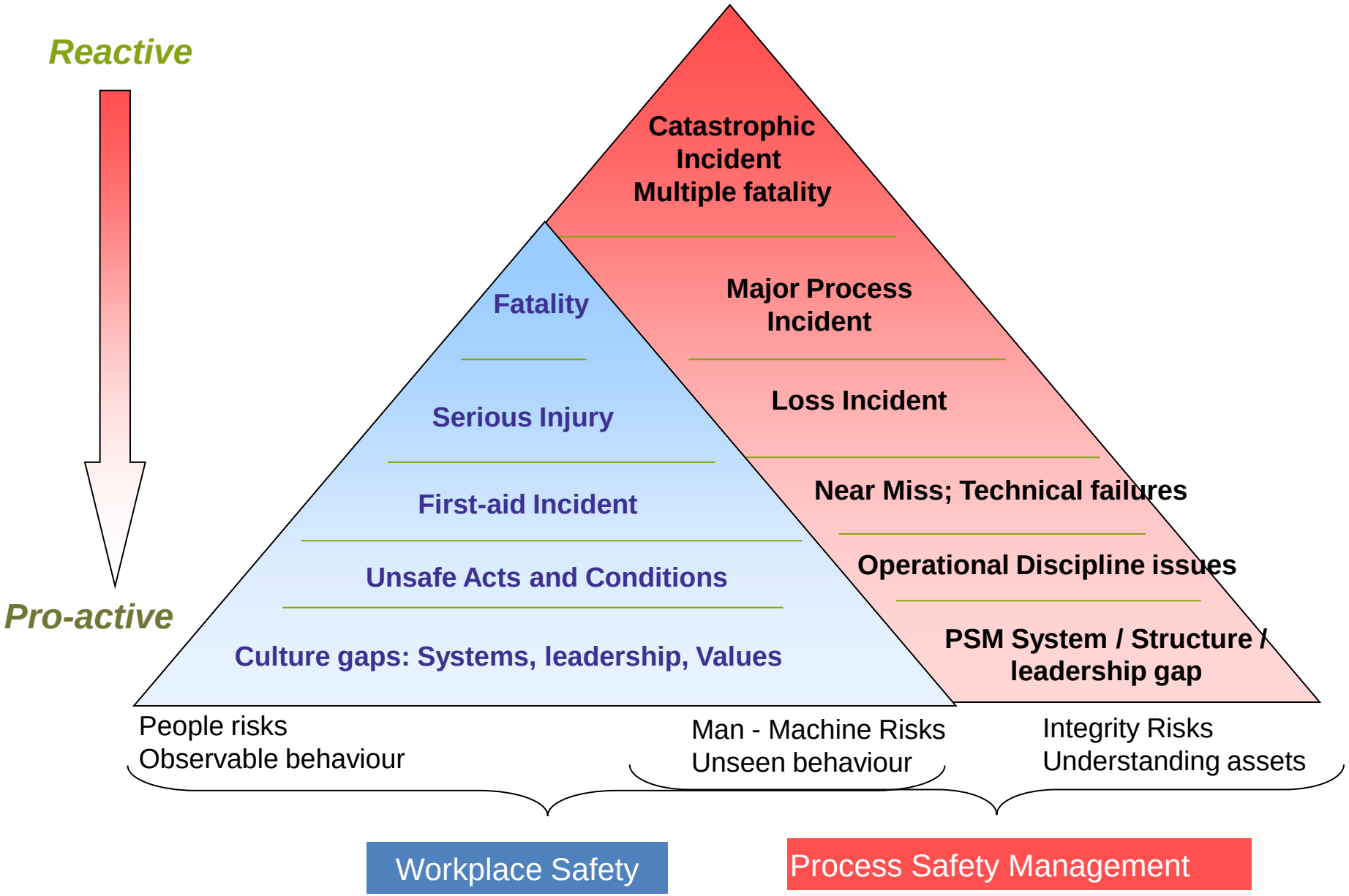


State of Operational Effectiveness

SHE Organisation

Line Organisation

From people safety to process safety



Process Safety Management Model

Examples of management processes supporting PSM Culture

Leadership

Management commitment
Policies and principles
Goals, objectives and plans
Procedures and performance standards

- Corporate PSM standard with many requirements beyond compliance
- Global PSM metrics defined and targets set for overdue reduction. Quarterly PSM metric reporting & review with Operations Directors.
- PSM results are part of performance management

Structure

Line Mgmt accountability & Resonsibility
Safety Personnel
Integrated organisation structure
Motivation and awareness

- Ops director sponsors PSM competency team; Site managers lead PSM committees
- Dedicated expert resources (PSM, HTM, MIQA) at sites, supported by regional and global expert teams.

Processes and Actions

Incident Investigation
Audits & observations
Effective communication
Training & development

- Reporting, scoring and communication of PSM incidents and near misses. 450 incidents are reported yearly in EMEA (30 plants).
- Focused, dedicated 2nd party PSM audits with scoring.
- PSM and MIQA training focused on leadership, maintennce management, expert resources

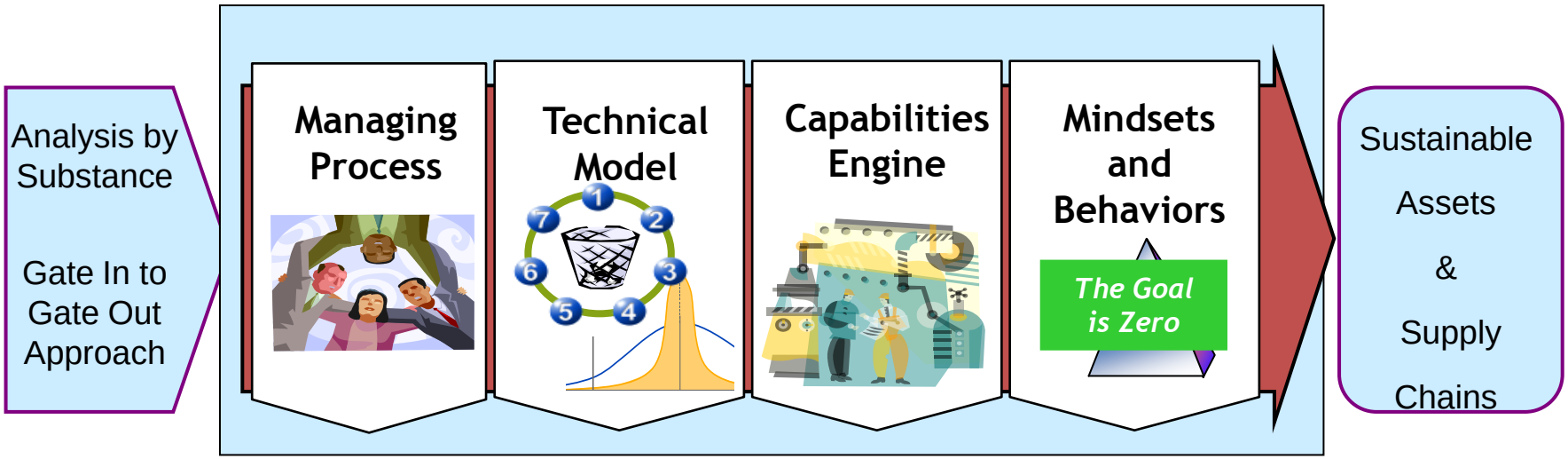
Case: Zero Leak commitment in Crop Protection business

Challenge

The site produces herbicides, fungicides and pesticides. Trace contamination was found in aquifer and downstream wells.

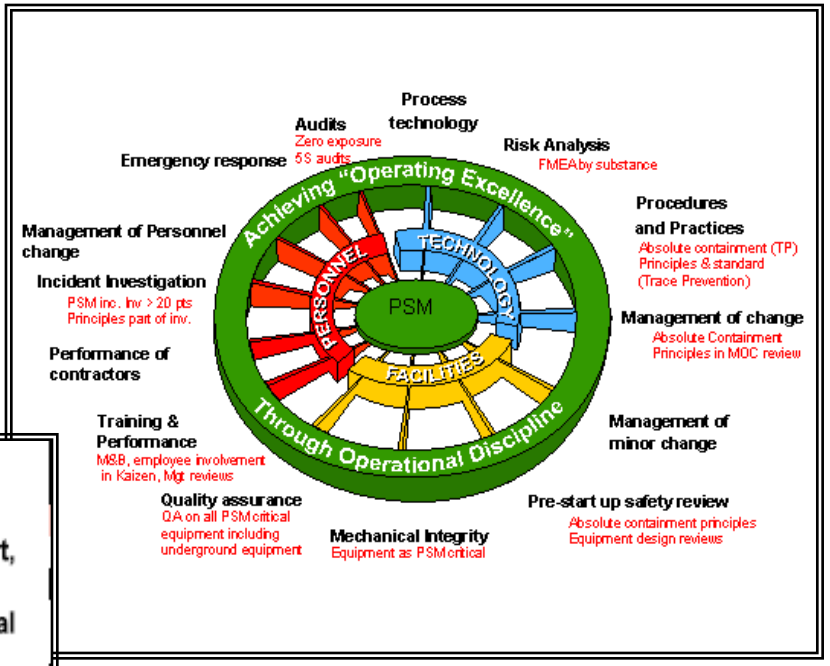
Approach

- Developing “Zero leak / Abolute containment” culture
- Build on “DPS” (DuPont Production System) to ensure full engagegement and sustainability
- Maintain open and close cooperation with the surrounding community



Leadership and Management Processes

- Development of Vision & Principles
- Integration in PSM Management system
- Audits



« Absolute containment » : 10 principles

1. All leaks and spills can and must be prevented and emissions controlled (report, control, investigate, corrective/preventive actions).
2. Between any chemical and myself, between any chemical and the external environment, there are always at least two lines of defense.
3. Unit operating practices must be described as procedures and reviewed for continuous improvement. They must be standardized and communicated.
4. The use of water or solvents must be efficiently managed to minimize their consumption and waste generation.
5. All retention basins and dikes must be free of chemicals.
6. The transportation and storage of materials outside of the buildings must be environmentally secured.
7. All equipments and people leaving the unit or area must be free of product.
8. All leaks and spills must be contained as close as possible to the source.
9. All site modifications must be made such that they meet the « Absolute Containment » principles.
10. The installations must be controlled and maintained in accordance to the « Absolute Containment » principles.

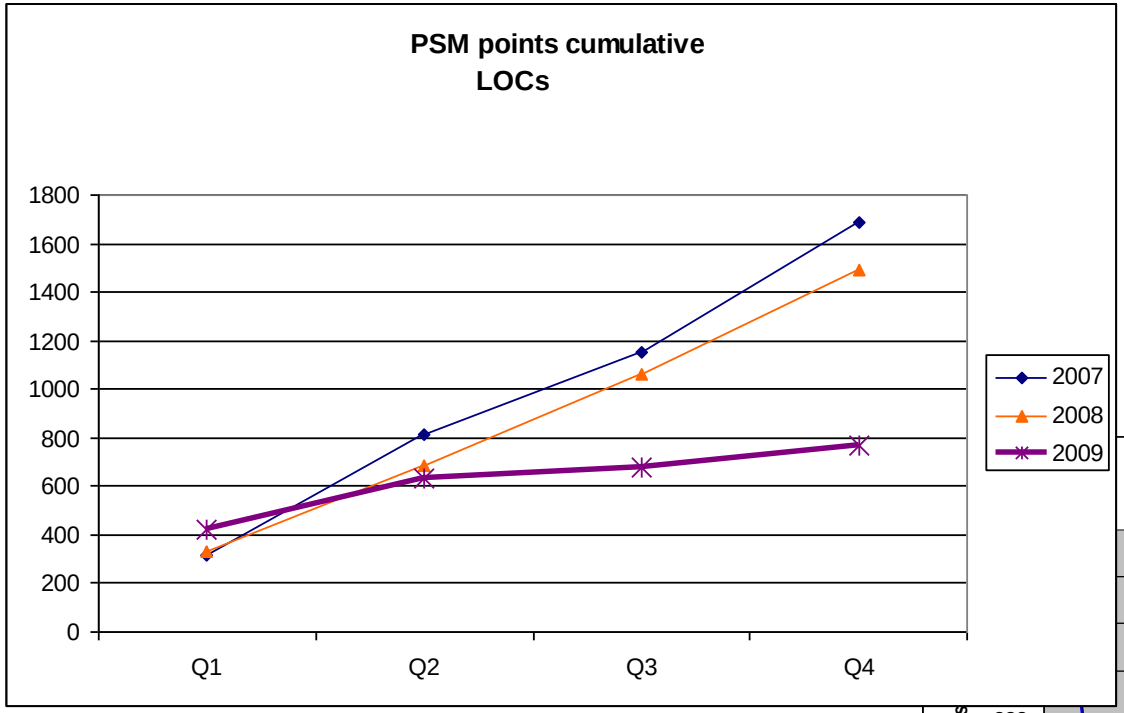
Technical Tools

- FMEA to identify and prioritise all possible failure moded (625 line items)
- Point Kaizen to adress sources of leaks and ensure double barrier principle

Mindset & Behaviour

- Engagement of everyone
- Auditing processes
- Visual management

Results


PSM points cumulative
LOCs
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Q3
Q4
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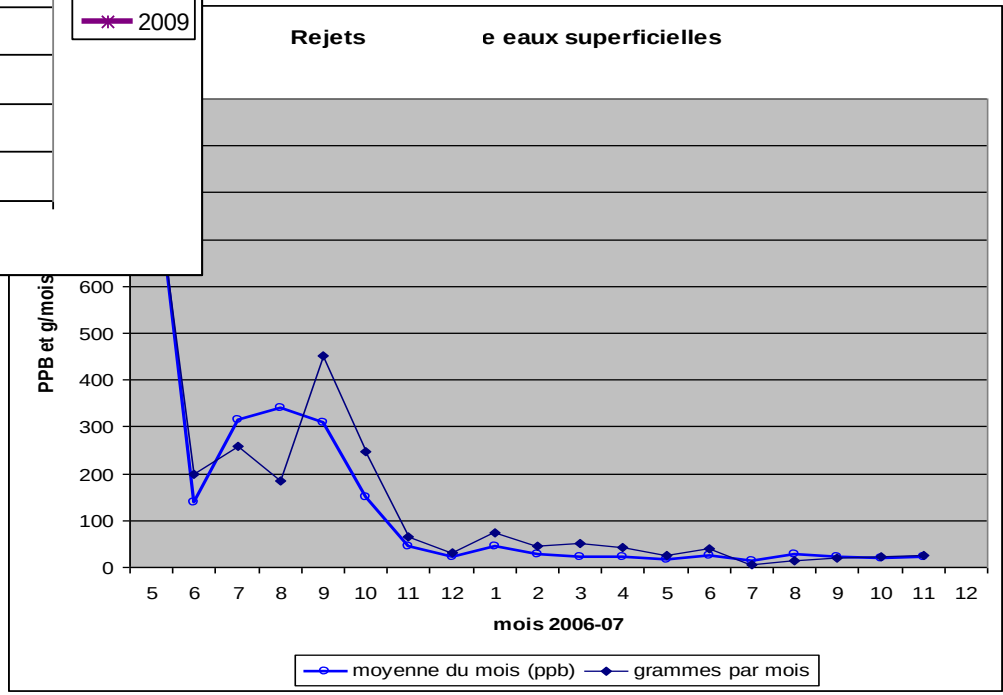
2008
2009


Rejets
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grammes par mois

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