

Chemical Reactivity Management

An Overview



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Outline

1. Problem
2. Initial CCPS Work
3. Practices Essential to Managing Chemical Reactivity Hazards—The CCPS Essential Practices Publication
4. Work of the RMR
5. The OSHA Alliance
6. Path Forward

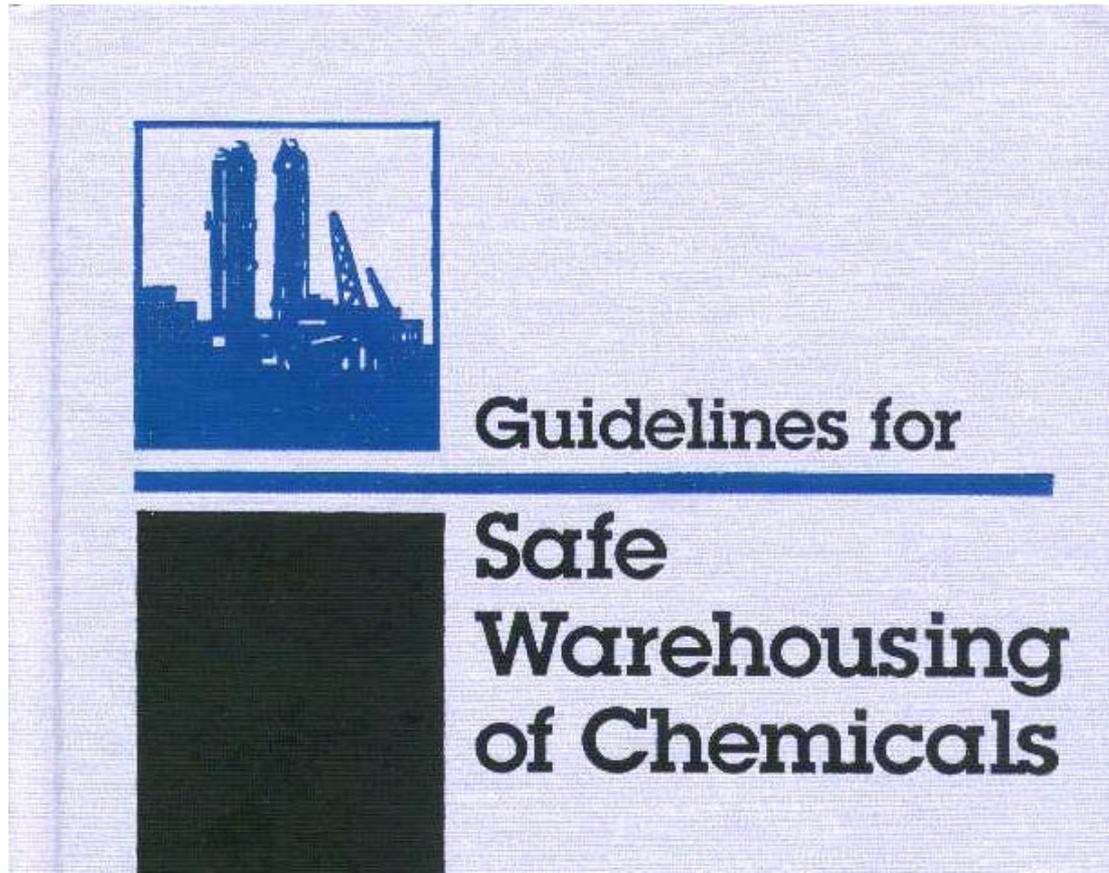
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The Problem

- 2002 CSB Report
 - 167 incidents in a 21 year period
 - 108 fatalities
 - Significant property damage
- Data are incomplete, and certainly underestimate the magnitude of the problem
- In 90% + of all incidents studied, the information necessary to have prevented the incident was documented and publicly available.

Probable Audiences

- “No Chemistry” Users



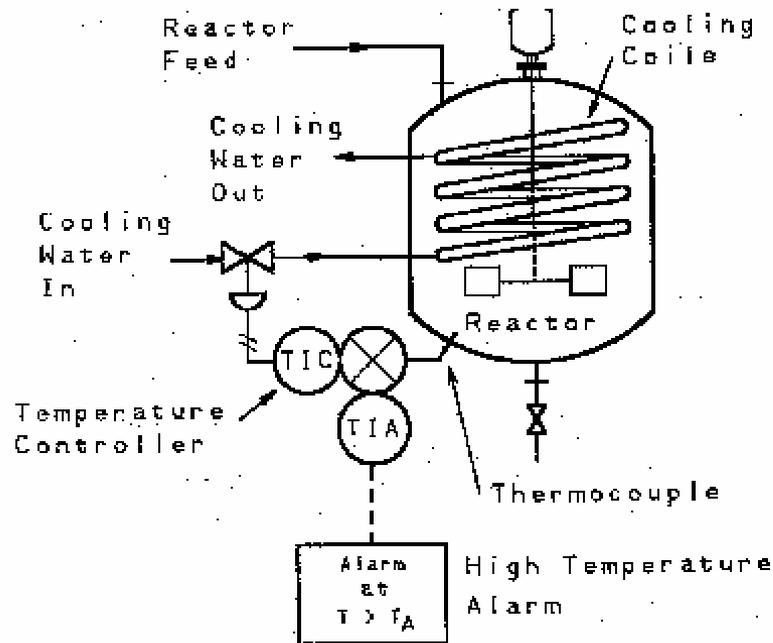
Probable Audiences

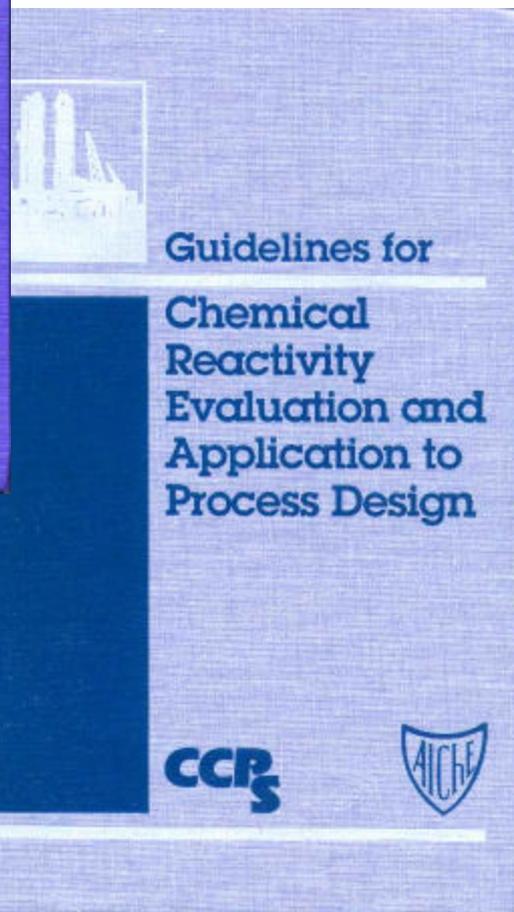
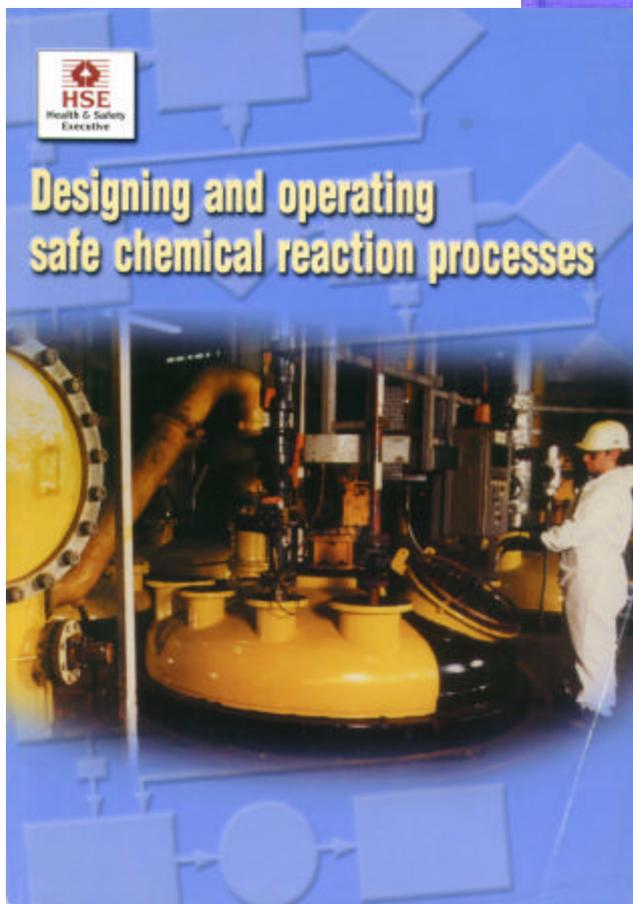
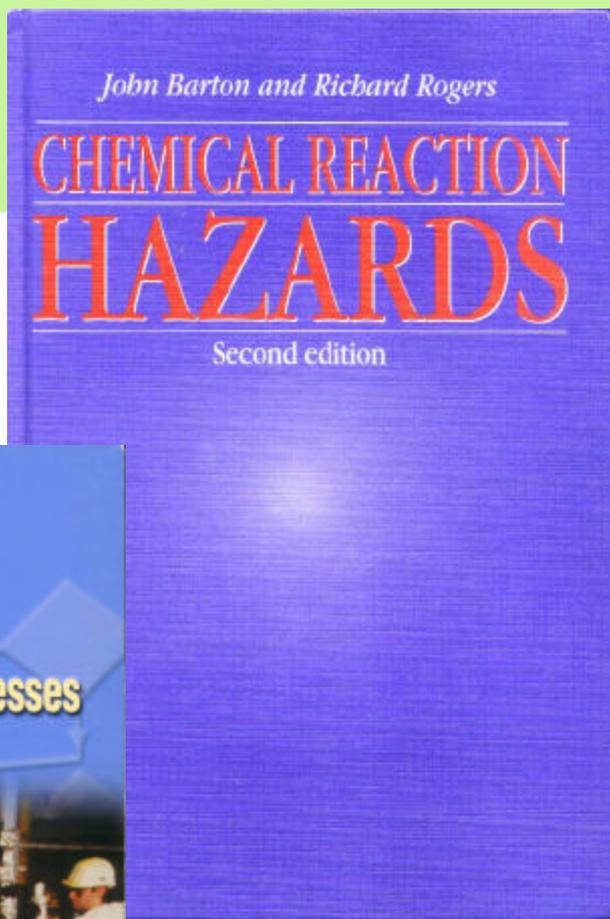
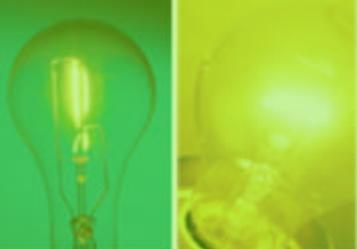
- “No Chemistry” Users
- “Unintentional Chemistry” Users



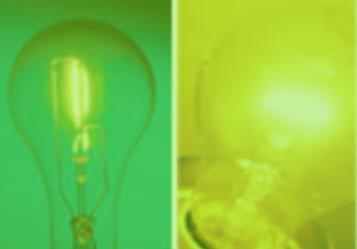
Probable Audiences

- “No Chemistry” Users
- “Unintentional Chemistry” Users
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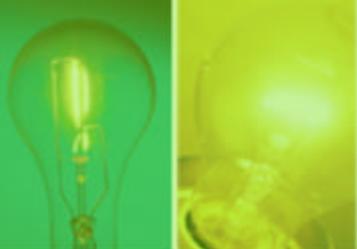
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Probable Audiences

1. “No Chemistry” Users
2. “Unintentional Chemistry” Users
3. “Intentional Chemistry” Users

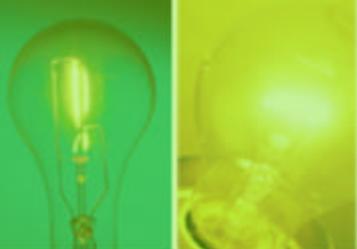
OR, more specifically:

1. Storage, Handling and Repackaging
2. Mixing and Physical Processing
3. Intentional Chemistry

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Guiding Principles

- Use existing information
- Apply appropriate levels of technology to the different audiences
- Identify areas requiring additional testing, data generation
- Use existing management systems/ structures

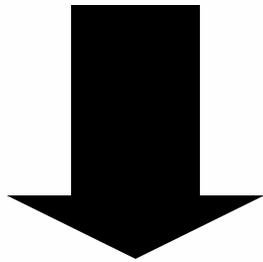


Proposed Solution

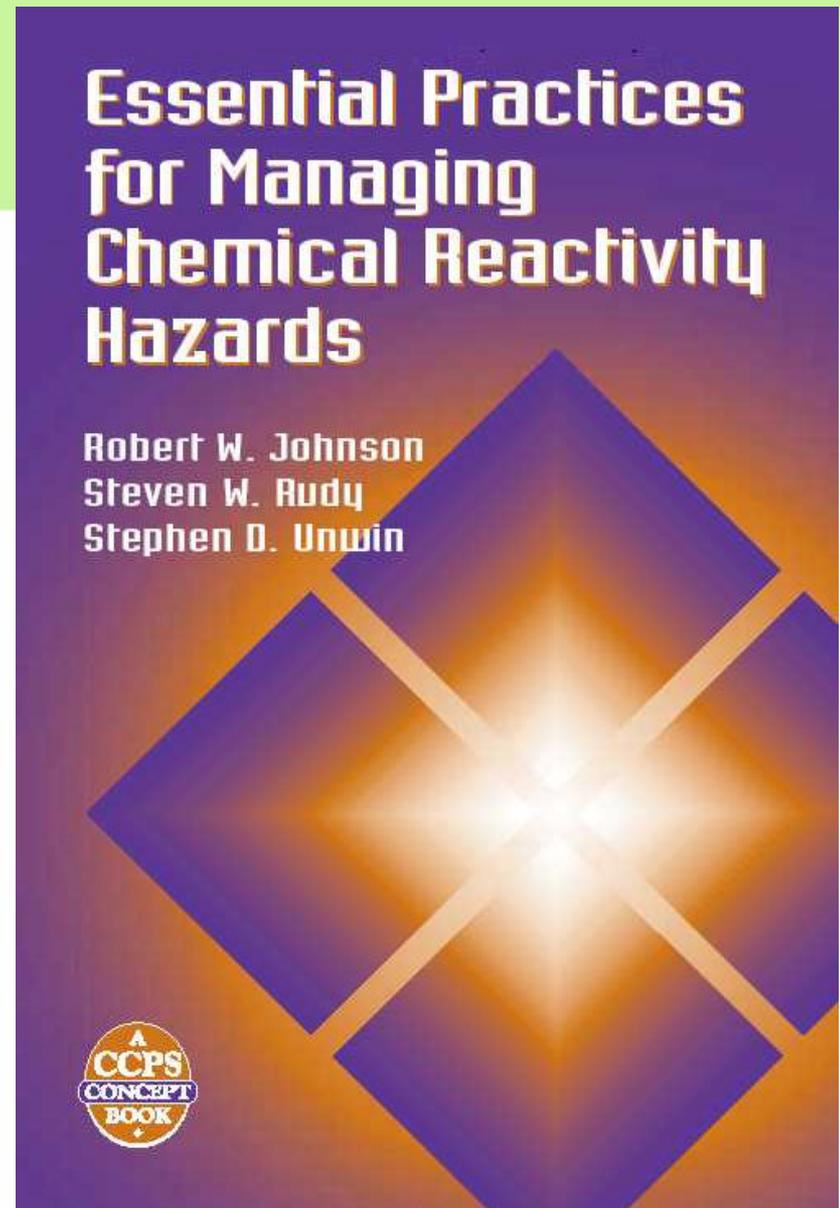
- Preliminary Screening Method
- Management System Framework



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- Management System Framework



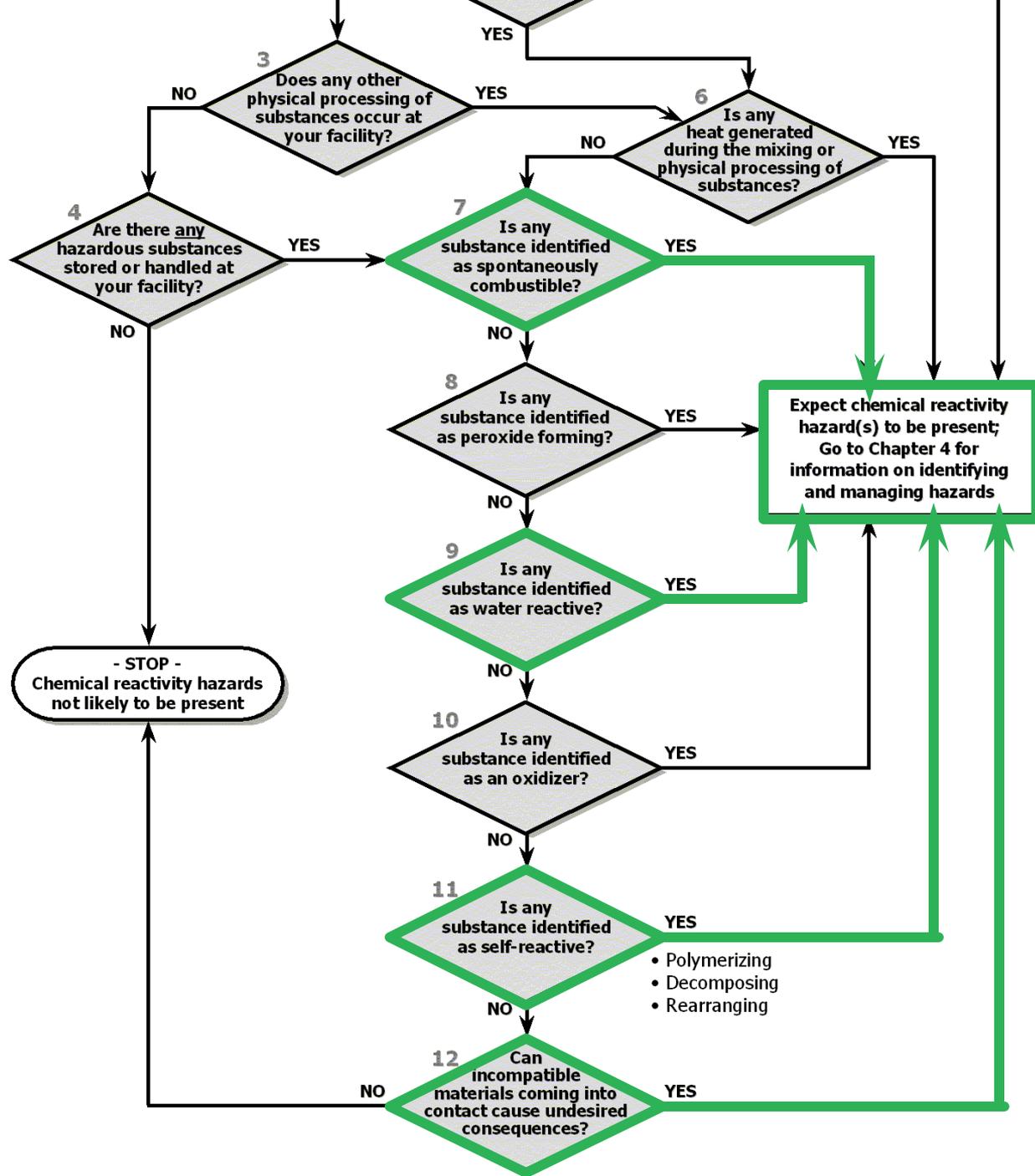
- “Concept Book”
- ~ 200 pages
- Published 3/03





Preliminary Screening for Chemical Reactivity Hazards

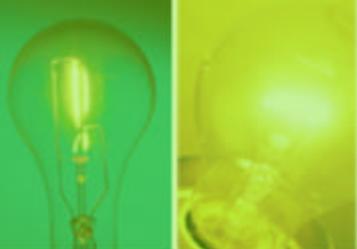
Summary Flowchart



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Essential Management Practices

- 4.1 Put Into Place a System to Manage Chemical Reactivity Hazards
- 4.2 Collect Reactivity Hazard Information
- 4.3 Identify Chemical Reactivity Hazards
- 4.4 Test For Chemical Reactivity
- 4.5 Assess Chemical Reactivity Risks
- 4.6 Identify Process Controls and Risk Management Options

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Essential Management Practices

4.7 Document Chemical Reactivity Risks and Management Decisions

4.8 Communicate and Train on Chemical Reactivity Hazards

4.9 Investigate Chemical Reactivity Incidents

4.10 Review, Audit, Manage Change and Improve Hazard Management Practices and Program

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Further CCPS Efforts—the RMR

- To enhance the previous work, and develop new tools for specific customers, the Reactivity Management Roundtable (RMR) was formed.

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Further CCPS Efforts—the RMR

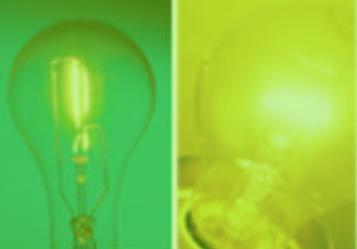
- The purpose of the RMR:

"....to establish a not-for-profit scientific and educational organization to help reduce the frequency and consequences of reactive chemical incidents. RMR members will work cooperatively to assimilate, implement, maintain, and update effective practices for managing chemical reactivity."



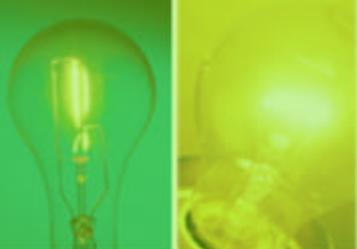
Reactivity Management Roundtable

- The objectives in meeting this purpose are:
 1. Educate stakeholders on cost-effective approaches that promote effective management of chemical reactivity hazards
 2. Synthesize, and make available, existing effective practices for managing chemical reactivity in forms conducive to use by companies with limited resources, and
 3. Share the member's knowledge and findings via effective delivery mechanisms



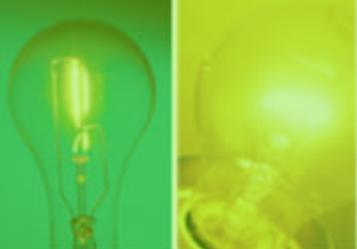
Current RMR Activities

- **Create three working groups to write “effective practice(s)” in three compatible parts that can be used stand-alone or together**
 - Chemical Processing – Tony Thompson (Monsanto)
 - Physical Processing – Don Connolley (Akzo-Nobel)
 - Storage and Repackaging—Pete Lodal (Eastman Chemical)



Implementation Staging

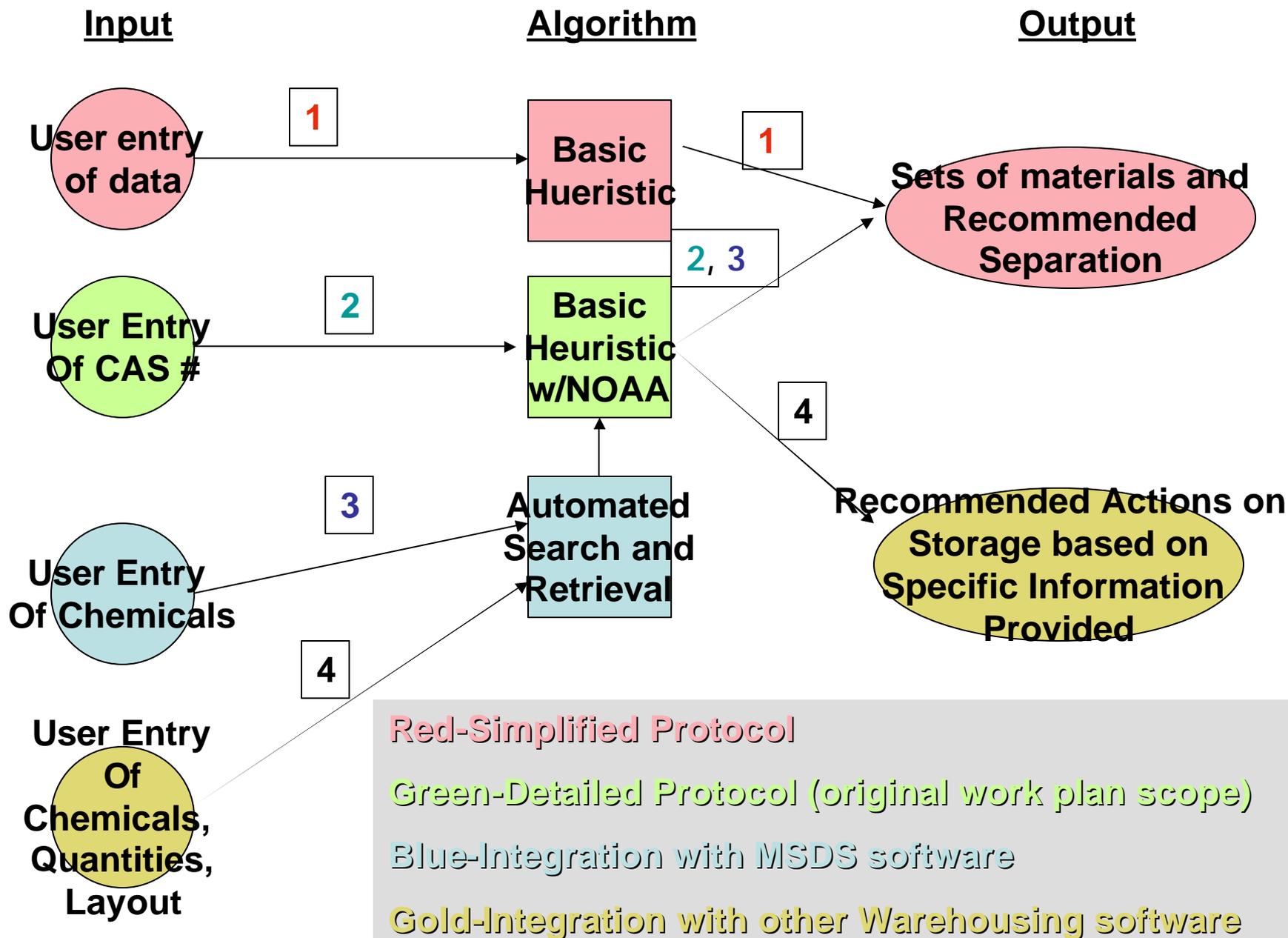
- Step 1—Simplified Protocol—Automation of Separation Matrix
- Step 2—Detailed Protocol—Automation of NOAA Worksheet
- Step 3—Data Retrieval--Automation of MSDS input
- Step 4—Integration of Specific Warehouse information for overall storage solution

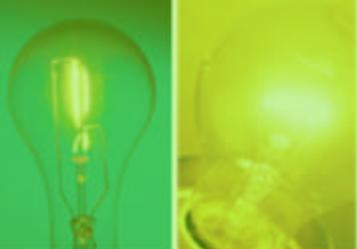


Simplified Protocol

- Automated Spreadsheet based on DOT/UN Shipping Classifications

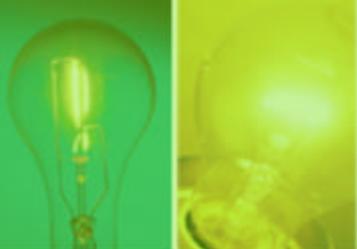
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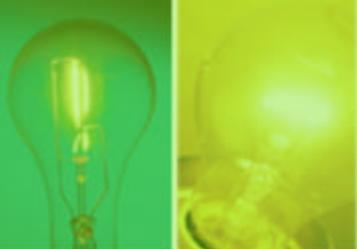
Path Forward for 2006

1. Continue in a parallel path with both protocols
 - Publish simplified protocol as first installment of an "Effective Practices" document
 - Program with available resources
 - Complete development of detailed protocol
 - Open programming discussions with various parties, using simplified protocol as a springboard

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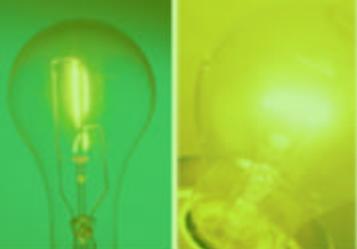
OSHA Alliance

- Much of what the RMR hopes to accomplish will be done in conjunction with an OSHA alliance, formed in March 2004.
- Signatories to the Alliance are:
 - Occupational Safety & Health Administration (OSHA)
 - Environmental Protection Agency (EPA)
 - American Chemistry Council (ACC)
 - Center for Chemical Process Safety (CCPS)
 - Mary Kay O'Connor Process Safety Center (MKOPSC)
 - National Association of Chemical Distributors (NACD)
 - Synthetic Organic Chemical Manufacturers



OSHA Alliance

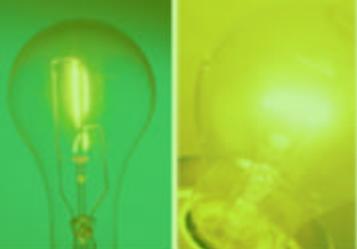
- Why an Alliance?
 1. Build on CCPS work
 2. Response to CSB finding – problem not availability of information but tools for getting it and using it
 3. Immediate positive impact – get resources out to those who need them

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Purpose of the Alliance

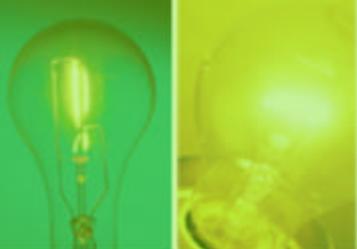
Provide information, guidance, and access to training resources to members, customers, contacts and others involved in the manufacture, distribution, use and storage of chemicals in order to:

Protect communities and employee health and safety
Improve identification and management of CRH

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Goals of the Alliance

- Training & Education
- Outreach & Communications
- Promoting National Dialogue

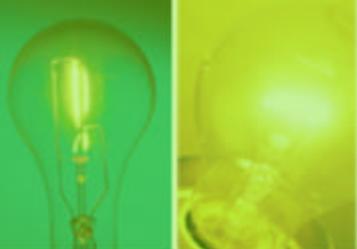


Training & Education

Jointly develop and deliver training addressing chemical reactivity hazards, to be delivered in conferences, meetings, OSHA Training Institute (OTI) Education Centers, or through distance learning.

Examples:

- Electronic assistance resources (e.g., interactive software e-Tools, technology-based training)
- Training and materials for OSHA & EPA staff
- Customized tools for specific sectors, such as SMEs.



Outreach & Communication

- Develop and disseminate information through print and electronic media
 - make *Essential Practices* available in the open literature
 - disseminate and encourage the use of *Essential Practices* to members and their value chains.
- Collaborate with other Alliances & parties on specific issues and projects as appropriate
- Deliver presentation at signatories conferences, meetings, events as appropriate



Progress to Date

- The Alliance has delivered two 4 hour workshops on Chemical Reactivity Management in Atlanta and Houston.
- A third is scheduled for summer in Los Angeles



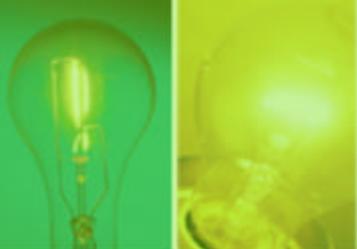
Additional Information

- For more information on the RMR:

www.aiche.org/CCPS/ActiveProjects/RMR/index.aspx

For more information on the OSHA alliance:

www.osha.gov/dcsp/alliances/reactives/reactives

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Questions?