Hazardous Materials Cooperative Research Program: A Status Report

DETAILS

4 pages | | PAPERBACK

ISBN 978-0-309-21371-4 | DOI 10.17226/14602

AUTHORS

December 2011

HAZARDOUS MATERIALS COOPERATIVE RESEARCH PROGRAM
Sponsored by the Pipeline and Hazardous Materials Safety Administration

Research Results Digest 2

HAZARDOUS MATERIALS COOPERATIVE RESEARCH PROGRAM: A STATUS REPORT

This is a staff digest of the program and status of the Hazardous Materials Cooperative Research Program, which is administered by the Transportation Research Board of the National Academies. The program is managed by Crawford Jencks, Deputy Director, Cooperative Research Programs. Individual contract research projects are managed by William C. Rogers, Senior Program Officer.

BACKGROUND

The HMCRP is a cooperative research program sponsored by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and administered by the Transportation Research Board. It is an industry-driven, applied research program that develops near-term, practical solutions to improve the information used in managing risk associated with the transportation of hazardous materials. The program was authorized as a pilot program in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005. The act specified that the program address nine topics:

(1) Assessment of opportunities to integrate and supplement safety and security measures for hazardous materials transportation.
(2) Data on predominant traffic and highway geometric characteristics in large-truck crashes for use in risk analysis.
(3) Recommendations for development of conditional release probabilities for bulk containers involved in transportation accidents.
(4) Development of correlations between incident risks and consequences to aid in decision-making models.
(5) Development of an environmental hazard assessment system for the transport of hazardous materials.
(6) Recommendations for commercial transportation-incident and commodity-flow data collection and reporting.
(7) Detailed information for conducting hazardous materials commodity-flow studies.
(8) National hazardous materials emergency-response capability assessment.
(9) Transportation emergency-response guidelines for hazardous materials.

Program guidance is provided by a Technical Oversight Panel comprised of a representative cross section of hazardous materials stakeholders appointed by the Transportation Research Board. The HMCRP Technical Oversight Panel meets annually to formulate the research program by identifying the highest priority projects and defining funding levels and expected products. Research problem

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statements recommending research needs for consideration by the Technical Oversight Panel are solicited annually, but may be submitted to TRB at any time. See HMCRP website at www.TRB.org/HMCRP.

INTRODUCTION

The safety, security, and environmental concerns associated with transportation of hazardous materials are growing in number and complexity. Hazardous materials are substances that are flammable, explosive, or toxic, or that, if released, produce effects that would threaten human safety, health, the environment, or property. Hazardous materials are moved throughout the country by all modes of freight transportation, including pipelines, ships, trucks, trains, and airplanes. Hazardous shipments vary in size and type, from small parcels containing a few ounces of infectious or radioactive substances, to barges and railroad tank cars carrying tons of flammable, toxic, and corrosive materials.

The freight transportation and chemical industries, government regulatory and enforcement agencies at the federal and state levels, and local emergency planners and responders routinely share information, resources, and expertise. Nonetheless, a longstanding gap in the system for ensuring hazardous materials safety and security occurs in the conduct of research. Industry organizations and government agencies have their own research programs to support their mission needs. Collaborative research to address shared problems takes place occasionally, but most occurs on an ad hoc basis.

Acknowledging this gap, the U.S. DOT Office of Hazardous Materials Safety, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, and the U.S. Coast Guard pooled their resources for a study. Under the auspices of TRB, the National Research Council appointed a committee to examine the feasibility of creating a cooperative research program for hazardous materials transportation, similar in concept to the National Cooperative Highway Research Program (NCHRP) and the Transit Cooperative Research Program (TCRP). The committee concluded, in TRB *Special Report 283: Cooperative Research for Hazardous Materials Transportation: Defining the Need, Converging on Solutions,* that the need for cooperative research in this field is significant and growing and offered ideas on establishing an ongoing program of cooperative research. Based in part on the findings of that report, the Congress authorized PHMSA to contract with the National Academy of Sciences to carry out the research discussed in TRB *Special Report 283.*

THE HMCRP

On September 1, 2006, PHMSA awarded a contract to the National Academies to initiate the HMCRP. The HMCRP is managed using procedures modeled after those used by TRB in managing the National Cooperative Highway Research Program and other cooperative research programs. TRB solicits potential research problem statements from all parties. The HMCRP Technical Oversight Panel selects and prioritizes these research needs based on the funding available. Each selected project is assigned to a panel, appointed by TRB, which provides technical guidance and counsel throughout the life of the project. Heavy emphasis is placed on including members representing the intended users of the research products. The panels prepare requests for proposals and select contractors, guide the projects, and review reports. Day-to-day program management is provided by HMCRP staff and includes the following tasks:

- Assisting the Technical Oversight Panel in identifying and prioritizing research needs;
- Appointing and coordinating expert technical panels to guide research projects;
- Developing and distributing Requests for Proposals (RFPs);
- Processing and evaluating proposals to select the best qualified research agencies;
- Executing contracts with the selected researchers;
- Guiding the research;
- Reviewing research reports;
- Publishing and disseminating research reports; and
- Promoting the application of research results.

Table 1 HMCRP Technical Oversight Panel

Chair	Cheryl A. Burke	Dow Chemical Company
Member	John C. Allen	Consultant
Member	Christopher Barkan	University of Illinois
Member	Samuel S. Elkind	United Parcel Service
Member	Robert E. Fronczak	Association of American Railroads
Member	C.A. Lidicker	CF Industries, Inc.
Member	Randolph Martin	DuPont Company
Member	Eileen M. Phifer	Michigan DOT
Member	William L. Reese	Idaho State Police
Member	Thomas Richardson	Seattle Fire Department
Member	Barbara Windsor	Hahn Transportation
Member	Matt Woodruff	Kirby Corporation
Ex Officio Voting	Paul Bomgardner	Federal Motor Carrier Safety Administration
Ex Officio Voting	Charles H. Hochman	Pipeline and Hazardous Materials Safety Administration
Other Liaison	Richard Bornhorst	U.S. Coast Guard
Other Liaison	Ronald J. Duych	Bureau of Transportation Statistics
Other Liaison	George R. Famini	Department of Homeland Security
Other Liaison	Francisco Gonzalez, III	Federal Railroad Administration
Other Liaison	Scott Gorton	Transportation Security Administration
Other Liaison	Bud Hunt	Transportation Security Administration
Other Liaison	Craig Matthiessen	Environmental Protection Agency
Other Liaison	Bill Schoonover	Federal Railroad Administration
Other Liaison	Bill Wilkening	Federal Aviation Administration

Table 2 HMCRP Research Projects, FY 2006-2011*

HM-01	Hazardous Materials Commodity Flow Data and Analysis (Completed)
HM-02	Hazardous Materials Transportation Incident Data for Root Cause Analysis (Completed)
HM-03	A Guide for Assessing Emergency Response Needs and Capabilities for Hazardous Materials Releases (Completed)
HM-04	Emerging Technologies Applicable to Hazardous Materials Transportation Safety and Security (Completed)
HM-05	Evaluation of the Use of Electronic Shipping Papers for Hazardous Materials Shipments
HM-06	Soil and Groundwater Impacts of Chemical Mixture Releases from Hazardous Materials Transportation Incidents (Completed)
HM-07	Accident Performance Data of Bulk Packages Used for Hazardous Materials Transportation
HM-08	Consolidated Security Credential for Persons Who Transport Hazardous Materials (Completed)
HM-09	Dry Ice Limits on Aircraft
HM-10	Current Hazardous Materials Transportation Research and Future Needs
HM-11	Improving Local Community Recovery from Disastrous Hazardous Materials Transportation Incidents
HM-12	Hazardous Materials Transport Risk Assessment: State of the Practice
HM-13	Role of Human Factors in Preventing Cargo Tank Truck Rollovers
HM-14	Improved Classification and Categorization of Water-Reactive Substances
HM-15	A Guide for Communicating Emergency Response Information for Natural Gas and Hazardous Liquids Pipelines
HM-16	Model Hazardous Materials Transportation Education Curriculum
HM-17	Methodology for Evaluating the Effectiveness of Hazardous Materials Transportation Training

* See the HMCRP website for project status at www.trb.org/CRP/HMCRP/HMCRP.asp

Table 3 Publications of the Hazardous Materials Cooperative Research Program

Reports

No.	Proj. No.	Title, Pages, Publication Year
1	HM-02	Hazardous Materials Transportation Incident Data for Root Cause Analysis, 124 p. (2009)
2	HM-06	Assessing Soil and Groundwater Impacts of Chemical Mixture Releases from Hazardous Materials Transportation Incidents (& CD 90), 64 p. (2010)
3	HM-01	Guidebook for Conducting Local Hazardous Materials Commodity Flow Studies, 188 p. (2011)
4	HM-04	Emerging Technologies Applicable to Hazardous Materials Transportation and Security, 132 p. (2011)
5	HM-03	A Guide for Assessing Community Emergency Response Needs and Capabilities for Hazardous Materials Releases (& CD 92), 120 p. (2011)
6	HM-08	Feasibility of a Consolidated Security Credential for Persons Who Transport Hazardous Materials, 84 p. (2011)

CDs

No.	Proj. No.	Title, Publication Year
90	HM-06	Chemical Mixture Tool for HMCRP Report 2 (2010)
92	HM-03	Worksheets for Assessing Community Emergency Response Needs for HMCRP Report 5 (2011)

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ISBN 978-0-309-21371-4
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These digests are issued in order to increase awareness of research results emanating from projects in the Cooperative Research Programs (CRP). Persons wanting to pursue the project subject matter in greater depth should contact the CRP Staff, Transportation Research Board of the National Academies, 500 Fifth Street, NW, Washington, DC 20001.