

6.0 Conclusions

Phase I of this study has developed a methodology to enhance the data collection associated with serious hazardous materials crashes and evaluated its usefulness in performing safety analyses. The method employed successfully demonstrated the feasibility of:

1. Identifying key data elements needed to supplement MCMIS to improve serious HM crash data
2. Developing criteria for selecting serious HM crashes within MCMIS
3. Developing an electronic Serious HM Crash Database form for compiling and analyzing data about particular crashes
4. Importing applicable HM crash information from HMIS into MCMIS
5. Collecting and using PARs to provide supplemental crash data
6. Contacting outside sources to collect important information not available in MCMIS, HMIS or the PARs
7. Analyzing the database to develop conclusions concerning patterns and relationships.

This effort has demonstrated that more and better data could be collected on serious HM truck crashes. By collecting PARs for selected crashes, it is possible to populate records that are incompletely reported in MCMIS, remove inconsistencies and expand field definitions. Analyses performed on the enhanced database clearly show that it is possible to obtain an improved understanding of not only specific crashes, but also patterns and relationships among variables, such as the first harmful event and crash causation.

It should be possible to successfully implement this approach at a larger scale, perhaps at a target of twenty five to fifty percent of the HM crashes included in MCMIS for a given year. By applying the methodologies and tools developed in Phase I, this larger sample would allow for the development of statistically credible relationships that could be used to help improve HM truck safety. This process could also become the basis for developing an ongoing serious HM crash program, perhaps modeled on existing programs such as the Trucks in Fatal Accidents (TIFA) activity.

6.1 Police Accident Reports

A significant Phase I finding is that the PAR contains much valuable information that is not currently being recorded or is being inaccurately coded in MCMIS. By utilizing PAR information in populating the Serious HM Crash Database, a more complete crash description is obtained.

Working with PARs from multiple states during Phase I also provided insight into problems faced by state transportation officials responsible for preparing MCMIS records. PAR forms are not standardized; length of forms, information collected, and codes differ. This means that, for each state, the DOT official who prepares the MCMIS file must perform a unique translation from the PAR to MCMIS. Through the process of reading and interpreting data in the PAR, it was apparent that the translation from the PAR to MCMIS is a major source of inconsistencies in MCMIS.

Another insight related to data on cargo tanks. While many of the PARs contained sketches of vehicle configurations that could be circled by the reporting officer, the cargo tank configuration was not one of the configurations shown. In most cases where cargo tanks were involved, the vehicle configuration is listed in MCMIS as semi-trailer and the cargo configuration, since it is not one of the entries in the PAR, is simply left blank. This inconsistency was corrected in the enhanced database, with the result that the number of cargo tank crashes increased significantly. As a consequence of this correction, more than half of the Phase I sample was shown to have involved a cargo tank.

Perhaps the most useful part of the PAR entered into the Serious HM Crash Database, but not captured in MCMIS, is the memo field describing the crash. If that field were coded in MCMIS additional information would be available to fill in the blanks, clarify questionable data and/or resolve inconsistencies between data entered in different fields.

6.2 Packaging Information

Prior to starting this project, the Battelle team realized that neither HMIS nor MCMIS captures the quantity of hazardous material being shipped. Knowing that several database managers and users consider this information to be useful, obtaining that data became a project priority. Of the 198 PAR's that were obtained, 154 carriers voluntarily provided information on the quantity of material shipped. About half of the remaining carriers refused, usually citing legal concerns. An equal percentage of the carriers were unavailable or the team was unable to contact an individual possessing that information.

The HMIS is the most complete source of packaging information. Where a crash was present in the HMIS, this proved to be good source of information and the project was not able to substantially increase the quantity or quality of this information from either the PARs or interviews with the carriers. Unfortunately, only 21% of the records in the Serious HM Crash Database were also recorded in the HMIS, so it was only possible to obtain package performance information for about one-fifth of the crashes without enhanced data collection measures.

The MCMIS file contains 122 spill and 92 non-spill crashes. Since non-spill crashes are almost never reported in HMIS, none of the 45 HMIS matches were non-spill crashes. Therefore, the best that one could hope for would be to obtain a match with the 122 spill crashes. It was somewhat disappointing that the team was only able to obtain package information for less than 40% of these spill crashes.

Until there is a requirement for carriers to report non-spill crashes, there may never be an accurate reporting of package performance in an environment that covers most crashes. Where HMIS was unavailable to provide the packaging information, the team attempted to collect it through calls and interviews with carriers. Even in cases where the carriers were cooperative, unless the carriers compiled the information as part of their HMIS report, their response often was that they did not have any information on package performance.

Additionally, this project demonstrated that it is difficult to match crashes in MCMIS with HMIS records. One of the reasons is the absence of any common reporting field. HMIS does not report the carrier's DOT number, instead using a RSPA-assigned HM carrier code. By querying

several years of crash data, the Phase I effort was able to develop a cross-reference list for about 1,000 carriers. This list was obtained by looking for an exact match on carrier name. Since the truck driver provides the carrier name in the PAR file, the name frequently does not match the carrier name provided when the carrier registered with RSPA. Other fields such as the street address and city are frequently different as well. Currently, the project has developed only a small fraction of the needed cross-reference file. However, over time, as more matches are made between MCMIS and HMIS, the cross-reference list will become more complete and therefore more useful.

6.3 Recommendations for Future Investigations

The Phase I results have shown that data on serious HM crashes can be enhanced in a cost-effective manner to provide DOT officials, policy makers and other stakeholders with tools to more effectively analyze HM crashes, develop relationships and form conclusions that serve as the basis for decisions that could significantly impact HM transportation safety. As a next step in meeting this ultimate goal, it is recommended that the Phase I database form and data collection tools be utilized in a larger demonstration project that will enable the refinement of the methodology as well as improved analytical capabilities for HM crashes. It is also suggested that FMCSA explore the feasibility of utilizing this approach as the foundation of a long term specialized program (such as TIFA) to record, monitor, and analyze data on serious HM crashes.

In addition to these findings and recommendations, the following data collection improvements should be given serious consideration:

- Providing common identifiers (such as DOT number) between HM databases to enable more effective cross-database comparisons and sharing of data
- Collecting packaging information in HMIS for non-spill HM crashes with a severity equivalent to requirements for inclusion in MCMIS
- Identifying fields that could be populated in MCMIS that are typically available in PARs, which are known to provide useful information and could be captured with minimal effort on the part of state representatives
- Evaluating the information provided to MCMIS by each state in order to provide additional guidance to state representatives in cases where their interpretation of a field definition differs from the norm or intent of MCMIS
- Modifying the MCMIS database to include a crash description field
- Providing copies of the PARs to FMCSA for any crashes that meet the definition of a serious HM crash
- Exploring the feasibility of changing the HMIS reporting requirements so that carriers would be required to provide the quantity of material shipped and spilled in a crash
- Continuing to develop the common cross-reference file started as part of Phase I. This would make it easier for both FMCSA and RSPA to monitor crash reporting and thereby identify states and/or carriers that are not reporting HM crashes satisfactorily.