Motor Vehicle Fire Research Institute
Awarded Contracts

Title: Impact Induced Fires and Fuel Leakage: Statistical Analysis of FARS and State Data Files (1978-Present)

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Duration: August 15, 2002 – July 25, 2003

Purpose:

Previous work has focused on the seriousness or severity of fire related casualties, including injury and fatality frequencies during impact induced car fires. Additionally, impact induced fuel leakage has also been studied, which may be another indicator of the performance and crashworthiness of fuel systems. Due to the continued occurrence of these events, there appears to be a necessity to reevaluate this topic as it applies to the current U.S. vehicle fleet. This includes looking at the effects of model year, crash severity, fuel leak hazard, impact modes, and vehicle types. Previous studies have not focused on the vehicle mix, which has changed dramatically over the past decade. Of particular interest is the increasing population of vans, SUVs, and light trucks.

Several resources will be used to determine the factors related to the actual occurrence and impact of fires in light passenger vehicles. This will include a) an extensive literature review with an emphasis on work performed since 1990, b) an investigation into the availability of fire related data from state, federal, private, and international sources, c) a statistical analysis of national data from 1975-present (FARS), d) a statistical analysis of selected state accident records from 1978-present (3 states to be chosen). These multiple sources of data will address those questions identified in the previous paragraph and will characterize effectively the real world accidents in passenger vehicle fires. Further it will provide insight for additional questions that may be of interest in future investigations.

The project has been divided into the following Tasks with associated Deliverables:

- **Task 1 - Literature review**

  A report will be generated, which summarizes the literature review. All additional literature shall be delivered and incorporated electronically in the ACCESS format used for the GM Fire Bibliography. Specifically, this report will include, in greater detail, information that pertains to the execution of all subsequent tasks.

- **Task 2 - Evaluation of data sources**

  A report will be generated, which summarizes the findings from the review of available data sources. Each source will be described and details of fire related variables will be discussed. Descriptions of each state's data resources will be given and an evaluation of their capabilities for use in statistical analysis will be provided.

This includes characteristics that may affect accuracy of the results in subsequent tasks.

- **Task 3 - Verification of statistical methodologies – FARS and single state, 1978-1984 (Malliaris study)**

  A report will be generated, which summarizes the findings from the statistical analysis. Findings will be reported in a similar fashion to the previous work of Malliaris. Any discrepancies between this and previous work will be discussed with possible explanations. The statistical methods utilized will also be well documented so that the methodology for subsequent tasks is clear and acceptable to MVFRI.

- **Task 4 - Statistical analysis of modern fleet (FARS and single state, 1985-present)**

  A report will be generated, which summarizes the findings from this statistical analysis. Findings will be reported in a similar fashion to Task 3. Results from Task 3 will also be included to clearly illustrate any long term trends in the data. All trends in the data will be discussed, with particular attention on trends and data for the five most recent years.

- **Task 5 - Application of statistical analysis to multiple states (2 additional states, 1978-present)**

  A report will be generated, which summarizes the findings from this statistical analysis. Findings will be reported in a similar fashion to Task 3 and 4. Comparisons to previously analyzed state will be made. Any differing trends will be thoroughly discussed, with conclusions made on possible causation. Data collection methods and data quality will also be discussed.

- **Task 6 - Identification of data requirements for improved accuracy**

  A report will be generated, which summarizes the findings of tasks 2-5 with respect to overall data quality. Specific examples will be given to highlight any issues with data quality (good and bad). Recommendations will be made for improvements in the data collection, recording, and dissemination process. Additionally, beneficial qualities will be highlighted so that those items can continue into the future.

- **Task 7 - Project Report**

  A final project report will be generated. Although this final report will largely be an assembly of the reports from previous tasks, we will attempt to bring them all together. An overall discussion of the findings will be made with final conclusions and recommendations for future work.