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Safety Data Action Plan

Accident Casualty Reporting and Recording by DOT Modal Agencies: a Background Report

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400 Seventh St., SW
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Prepared by:
U.S. Department of Transportation
Research and Special Programs Administration
Volpe National Transportation Systems Center
Aviation Safety Division
Cambridge, MA 02142-1093

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16. Abstract This report was prepared in support of the Safety Data Action Plan (SDAP) sponsored by the Bureau of Transportation Statistics (BTS). This document supports the working group responsible for SDAP research Project #2 – <i>Develop Common Criteria for Reporting Injuries and Deaths</i> . It details the reporting criteria for accidental fatalities and injuries across the modes, summarizing the relevant text from the Code of Federal Regulations and agency public material. This report also describes how fatality and injury information is captured and reported within agency accident/incident databases.			
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Introduction

This report describes casualty data collected by U.S. Department of Transportation (US DOT) modal agencies caused by domestic transportation accidents. This report was prepared by the Volpe National Transportation Systems Center (the Volpe Center) in support of the Safety Data Action Plan (SDAP), sponsored by the Bureau of Transportation Statistics (BTS). The SDAP spans ten research projects divided among four working groups. This report supports the working group responsible for SDAP research Project #2 – *Develop Common Criteria for Reporting Injuries and Deaths*.

Each section presents an overview by mode of criteria for reportable accidents/incidents, criteria for reportable and non-reportable fatalities and injuries, and database conventions (including injury codes and severity scales). Definitions of reportable deaths/injuries and accidents/incidents, taken directly from the Code of Federal Regulations (CFRs), are very diverse among DOT agencies. (Text from most recent CFRs available – effective either in 2000 or 2001 – may be found using search tools of www.access.gpo.gov, a website maintained by the Government Printing Office.) This report concludes with some general observations about the reporting criteria and conventions among modal agencies.

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Section 1: Aviation

Accidents

An aircraft accident is defined by the NTSB and FAA as (46 CFR 830.2):

“...an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any such persons suffers death or serious injury, or in which the aircraft receives substantial damage.”

Any person who dies from injuries within 30 days of the accident is counted as a fatality as a direct result of the accident. (This 30-day span defines a fatal injury.)

The term serious injury means:

“...any injury which: (1) requires hospitalization for more than 48 hours, commencing within 7 days from the date an injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes or nose); (3) causes severe hemorrhages, or nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.”

The term substantial damage means:

“...damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft...”

However, damage such as engine failure, damage confined to one engine, ground damage to propellers or landing gear damage are *not* considered substantial.

Note that events with injury or fatality are considered accidents within a precisely defined span of time. Events are considered accidents during times when persons board ‘*with the intention of flight*’ and these same persons have deplaned safely. By the definition, *any* death or serious injury among passengers or crew is considered an aviation accident. Consequently, the FAA considers the following two events to be accidents with reportable fatalities:

- A flight attendant suffers a fatal heart attack in flight, yet the plane lands safely with no further injury to passengers or crew, and
- A skydiver (passenger) is killed when his/her parachute fails to open.

Industrial accidents meet the same criteria as aviation accidents, except that fatalities and injuries are sustained by persons other than passengers or members of the flight and cabin crews (e.g., ground crew(s), airport or airline employees). The criteria for an industrial accident also include death or serious injury. These events must be reported (using Form 8020-9, *Aircraft Accident/Incident Preliminary Notice*). However, investigative authority appears to rest with non-DOT public safety agencies.

Incidents

An aviation incident is a mutually exclusive event from an accident (49 CFR 830.2):

“...an occurrence other than an accident associated with the operation of an aircraft, which affects or could affect the safety of operations.”

Consequently, events – with one type of exception – for which the worst injury(ies) do not meet the definition of serious injury are classified as incidents, not accidents. The exception is a hazardous materials incident (FAA Order 8020.11B):

“...an incident that occurs during transportation of the material (including loading, unloading, or temporary storage) in which, as a direct result of any hazardous material:

- (1) A person is killed.*
- (2) A person received injuries requiring hospitalization.*
- (3) Estimated carrier or other property damage, or both, exceeds \$50,000.*
- (4) Fire, breakage, spillage, or suspected radioactive contamination occurs during shipment of radioactive materials.*
- (5) Fire, breakage, spillage, or suspected contamination occurs during shipment of etiologic agents.*
- (6) A situation exists that, in the judgment of the carrier, should be reported to the Department of Transportation (DOT) although the situation does not meet the criteria of paragraphs 5p(1) to 5p(5); e.g., a continuing danger to life exists at the incident scene.”*

Reporting Fatalities and Injuries

Notifying the FAA

Air traffic facilities are required to report all known and “suspected accidents” (e.g., loss of communications with an aircraft), all aircraft incidents and so-called “special emphasis” events involving celebrities, Members of Congress or Presidential and Vice Presidential aircraft. Air traffic facilities must also inform the FAA of events involving foreign aircraft whose first destination is within the United States and events involving aircraft that departed the United States for a foreign nation. In the case of accidents, the FAA must be notified within two hours of discovery of the accident.

FAA Forms

Among the FAA forms, only Form 8020-23 – used for both accidents and incidents – includes a subsection for describing injuries. This subsection is re-created in Figure 1 to illustrate how fatalities and injuries are tabulated by the FAA. Note the distinction between minor and serious injury¹. Persons affected in an aviation accident – those persons on an aircraft with the intent to fly – are categorized as members of the flight crew, cabin crew and passengers. Any

¹ No precise definition of minor injury has been found. Presumably, these injuries comprise those that do not meet the definition of serious injury.

other person is labeled *Other*. It appears from the FAA rules and procedures that this category includes casualties resulting from industrial accidents, and/or casualties among persons not on the aircraft, yet this is unclear.

On the form, the total number of passengers and crew are recorded in the last row "Total".

Injury Summary				Unknown ☐	
	Flt. Crew	Cabin Crew	Passengers	Other	Total
None					
Minor					
Serious					
Fatal					
Total					

Figure 1: FAA categories of fatalities and injuries (adapted from Form 8020-23)

Aviation Databases

The NTSB and the FAA each maintain accident/incident databases that record casualty information. NTSB has the only authority to assign cause, and therefore the FAA adheres to NTSB definitions of incident and accident (49 CFR 830.2). As a result of the definition of an aviation accident, both systems report injuries and deaths not directly attributable to the operation of aircraft.

Both systems record fatalities and injuries in the aggregate and neither the FAA A/IDS database nor NTSB database employs an injury severity scale. Direct examination of records from both systems highlighted inconsistencies between reported casualties. Queries of the FAA database for fatalities and injuries by accident/incident types are inconsistent with queries from the NTSB database (which are accepted as correct).

FAA Accident/Incident Database System

The FAA Accident/Incident Database System (A/IDS) records deaths and injuries for aviation-related accidents and incidents. Injuries are only reported in the aggregate; they are not reported by minor or serious injury.

On the other hand, A/IDS counts person types not explicitly defined on FAA Forms². In A/IDS, two additional categories, ground crew and the 'public', are defined. This latter category counts persons besides ground crew members killed or injured as the result of an aircraft mishap. For example (to paraphrase an actual case), in 1999 a private plane crashed into an automobile, killing both occupants of the plane and injuring all four occupants of the car, one seriously. Because A/IDS reports only injury totals, injury severity (minor or serious) may be determined only through the original narrative(s). Figure 2 depicts the injury and fatality variables in A/IDS.

² Forms are typically completed early on in the investigative process; not all facts are then known.
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Casualties	Total	Crew	Cabin	Passenger	Ground	Public
Fatalities						
Injuries						
Onboard						

Figure 2: A/IDS injury and fatality variables.

Direct examination of individual A/IDS records pointed out some errors in how injuries and fatalities are recorded:

- *Definitions of accident and incident result in confusion and mislabeled events.*

Many events in FAA databases are incorrectly labeled as incidents when they meet the criteria of accidents (and vice versa).

Thus, the FAA A/IDS database may record an event as an incident while the NTSB database may record it as an accident. Therefore, A/IDS queries on fatalities and injuries by 'incident' or 'accident' are not necessarily consistent with NTSB findings.

- *A/IDS injury and fatality statistics are inconsistent with the event narrative.*

For example, as a result of a 2001 private plane crash, all three occupants suffered minor injuries. However, the record for this event reports zero injuries.

- *In an A/IDS record, on-board statistics may count only fatalities and injuries.*

In several A/IDS records examined, the on-board statistics only totaled injuries and fatalities; they are not necessarily counts of all onboard.

- *A/IDS on-board statistics are inconsistent with the event narrative.*

For example, in 1998 the captain of a B-747 suffered a fatal heart attack during a flight. The narrative does not provide passenger counts, but does state that a deadheading captain assisted the first officer in landing the plane. Yet, the database record counts two persons on board: two crewmembers, zero cabin crewmembers and zero passengers. Even if there were truly zero passengers, FAA regulations require a cabin crew and the narrative states at least *three* persons were on-board (two captains and the first officer). In a 2001 case, a private plane crashed with the pilot and passenger suffering minor injuries. Yet, all casualty statistics are zero; the record counts zero injuries and zero persons on board.

NTSB Database

The NTSB database records fatalities and injuries in the aggregate. In contrast to the FAA A/IDS, the NTSB *does* classify injuries by severity (either serious, minor or none) but *does not* report casualty statistics by person type (e.g., flight crew, passenger or bystanders). The NTSB database possesses one record per crewmember per aircraft involved. Two text-based fields of this record,

Personnel Type and *Extent of Injury*, establish fatalities and injuries to flight personnel³. Passenger or bystander injuries are not reported, except in aggregate statistics.

For example, in the same 1999 case mentioned earlier, the NTSB database record reports:

- *Six* persons total were involved,
- *Two* persons total were killed,
- *Three* persons total sustained minor injuries,
- *One* person total sustained serious injuries,
- *Zero* persons total sustained no injuries.

The only individual named in the accident report with injury is the pilot. The only way to establish, *a*) how the other people were involved (i.e., 1 crew, 1 passenger (plane), 4 public (car)) and *b*) the extent of their injuries (i.e., two killed in the plane, 4 injured in the car – 3 seriously), is to read the report narrative.

³ Each FAA A/IDS report has similar records. But, they do not record injury or death.

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Section 2: Railroad

Reportable Fatalities and Injuries

The Code of Federal Regulations divides reportable railroad accidents/incidents into three groups (underlined text – added to the original – highlight criteria relevant to reporting fatality or injury):

“Group I--Highway-rail grade crossing. *Each highway-rail grade crossing accident/incident must be reported to the FRA on Form FRA F 6180.57, regardless of the extent of damages or whether a casualty occurred. In addition, whenever a highway-rail grade crossing accident/incident results in damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, or roadbed, that accident/incident shall be reported to the FRA on Form FRA F 6180.54. For reporting purposes, damages include labor costs and all other costs to repair or replace in kind damaged on-track equipment, signals, track, track structures, or roadbed, but do not include the cost of clearing a wreck.*

Group II--Rail Equipment. *Rail equipment accidents/incidents are collisions, derailments, fires, explosions, acts of God, and other events involving the operation of on-track equipment (standing or moving) that result in damages higher than the current reporting threshold (i.e. \$6,300 for calendar years 1991 through 1996, \$6,500 for calendar year 1997, and \$6,600 for calendar years 1998 through 2000) to railroad on-track equipment, signals, tracks, track structures, or roadbed, including labor costs and the costs for acquiring new equipment and material. Each rail equipment accident/incident must be reported to the FRA on Form FRA F 6180.54. If the property of more than one railroad is involved in an accident/incident, the reporting threshold is calculated by including the damages suffered by all of the railroads involved. See Sec. 225.23, Joint Operations. The reporting threshold will be reviewed periodically and will be adjusted every year.*

Group III--Death, injury, or occupational illness. *Each event arising from the operation of a railroad shall be reported on Form FRA F 6180.55a if it results in:*

- (1) Death to any person;*
- (2) Injury to any person that requires medical treatment⁴;*
- (3) Injury to a railroad employee that results in:*
 - (i) A day away from work;*
 - (ii) Restricted work activity or job transfer; or*
 - (iii) Loss of consciousness; or*
- (4) Occupational illness⁵ of a railroad employee.*

Events involving rail equipment that do not meet the injury criteria for Group III events (e.g., the most serious injury requires only first aid) must exceed Group II thresholds to be considered reportable. While all such accidents/incidents (and all associated fatalities and injuries) must be reported, immediate notification of the FRA (by telephone) is required only for a subset of Group III accidents/incidents that result in (49 CFR 225.9):

⁴ From 49 CFR 225.5: *“Medical treatment includes any medical care or treatment beyond first aid...”* but excludes *“diagnostic procedures”* and *“preventative emotional trauma counseling”* (except when treating a diagnosed mental disorder caused or aggravated by the event).

⁵ From 49 CFR 225.5: *“Occupational illness means any abnormal condition or disorder, of any person who falls under the definition for the classifications of Worker on Duty--Employee, Worker on Duty--Contractor, or Worker on Duty--Volunteer, other than one resulting from injury, caused by environmental factors associated with the person's railroad employment, including, but not limited to, acute or chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion, or direct contact.”*

“...(1) *Death of rail passenger or employee; or*
(2) *Death or injury of five or more persons.*”

Otherwise, the CFR only requires monthly reports of all railroad accidents/incidents⁶. Certain types of railroad accidents/incidents *need not be reported* by a railroad (49 CFR 225.15):

“A railroad need not report:

(a) *Casualties which occur at highway-rail grade crossings that do not involve the presence or operation of on-track equipment, or the presence of railroad employees then engaged in the operation of a railroad;*

(b) *Casualties in or about living quarters not arising from the operation of a railroad;*

(c) *Suicides as determined by a coroner or other public authority; or*

(d) *Attempted suicides.*”

The distinction between a train accident and a train incident with a reportable casualty is the extent of damage caused by the event. If damage exceeds the reporting threshold for an accident (\$6,600 in 2000) the event is classified as an *accident*. If damage is below the \$6,600 threshold, the event is an *incident*. A *non-train* incident is an incident (i.e., damage is beneath the accident threshold) with a reportable casualty but the event does not involve movement of on-track railroad equipment.

FRA Forms

FRA accident/incident report forms record fatality and injury totals; the supplemental sheet to the *Railroad Injury and Illness Summary* (FRA Form 6180.55a) details all fatalities and injuries using injury and illness codes (see the later section *FRA Injury Codes*). FRA report forms classify casualties either as “Fatal/Nonfatal” or “Killed/Injured”⁷.

Persons affected are classified differently across FRA forms. Report Forms submitted to the FRA differentiate between passengers, railroad employees and a broad group of other affected persons. Figure 3 reproduces subsections of the forms reporting rail equipment and grade crossing accidents, respectively, to illustrate the differences.

⁶ These reports “...shall be submitted within 30 days after expiration of the month during which the accidents/incidents occurred. (49 CFR 225.11)”

⁷ With one exception, FRA Form F 6180.41 Federal Accident Notification. On this form, casualties are classified as “Killed/Seriously Injured/Slightly Injured”. Classification criteria are not clear; the FRA *Guide* does not address this form.

Casualties for Rail Equipment events (Form FRA F 6180.54)

Casualties to:	Railroad Employees	Train Passengers	Other
Fatal			
Nonfatal			

Casualties for Highway/Rail Crossing events (Form FRA F 6180.57)

Casualties to:	Killed	Injured
Highway/Rail Crossing Users		
Railroad Employees		
Passengers on Train		

Figure 3: Casualties classified for FRA event report forms

Railroads are required to maintain detailed records of every casualty using FRA Form F 6180.97 or a suitable alternative. While these records are *not* submitted to the FRA, the same information must be reported on Form F 6180.55 (Figure 4).

Type of Person	Fatal	Nonfatal
Worker on duty – employee		
Employees not on duty		
Passengers on trains		
Nontrespassers/on railroad property		
Trespassers		
Worker on duty – contractor		
Volunteer – other		
Nontrespassers/off railroad property		
<i>Grand total</i>		

Figure 4: Casualties on Railroad Injury & Illness Summary (Form FRA F 6180.55)

Accountable Fatalities and Injuries

Railroads are required to maintain and visibly post – on railroad premises – lists of all employee injuries and illnesses (see 49 CFR 225.25(a) through 225.25(h)). The associated records must be made available for FRA inspection (49 CFR 225.25(g)). Yet, only casualties associated with reportable Group I, II or III events (see previous subsection) are tabulated by the FRA (49 CFR 225.17). The data not reported to the FRA comprise accountable injuries and illnesses (49 CFR 225.5):

“Accountable injury or illness means any condition, not otherwise reportable, of a railroad worker that is associated with an event, exposure, or activity in the work environment that causes or requires the worker to be examined or treated by a qualified health care professional. Such treatment would usually occur at a location other than the work environment; however, it may be provided at any location, including the work site.”

The railroad’s reporting officer normally determines whether an event is reportable or accountable based upon 49 CFR 225, accident reporting statutes and the *FRA Guide for Preparing Accident/Incident Reports*. Disputable cases

may be filed as “Claimed but not Admitted” and after reviewing all documentation, the FRA may decide to remove the event from the monthly submission of reports. Final determination of reportability always rests with the FRA (49 CFR 225.17). No timetables for these reviews are specified, so it is unclear how this review process impacts reportable (and tabulated) fatalities and injuries. It is unclear whether or not the FRA tabulates disputed casualties until reportability is determined.

The FRA Railroad Safety Advisory Committee

The FRA Railroad Safety Advisory Committee (RSAC) considers and recommends changes to FRA regulations, the FRA Guide for Preparing Accident/Incident Reports and forms. The RSAC is currently considering changes to FRA regulations that would:

- *Exclude* from reportability an injury to an employee of an independent contractor when off railroad property,
- *Expand* the categories of accidents/incidents arising from railroad operations that must be reported immediately to the FRA by telephone.

FRA Injury Codes

The FRA employs 4-character alphanumeric injury codes on FRA Form F 6180.55a⁸. Figure 5 explains the meaning of each element of an injury code (for example, the code ‘705C’ encodes a broken nose).

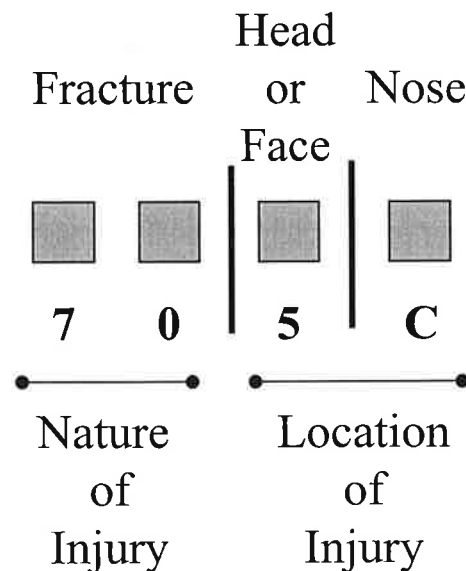


Figure 5: Sample FRA 4-character injury code

In a 4-character injury code, the first two characters always represent the nature of the injury; in the example ‘70’ encodes *fracture*. The third character always

⁸ A complete explanation and listing of codes may be found in Appendix E of the *FRA Guide for Preparing Accident/Incident Reports*.

represents a major body part (e.g., head, arm, torso); in the example '5' encodes *head or face*. The fourth character (a letter) encodes the specific body part; in the example 'C' encodes *nose*.

If a person sustains multiple injuries of equal severity (as determined by the reporter), the multiple location code '8' is used. For example, multiple abrasions to the arms and legs may be coded '308'; '30' encodes *cuts or abrasions* and '8' is the multiple location code. If a person sustains multiple injuries of differing severity, *only the most severe injury is coded*.

FRA Occupational Illness Codes

The FRA employs 4-digit occupational illness codes on FRA Form F 6180.55a⁹. A '9' as the fourth digit always indicates death from the particular illness within one year. FRA regulations pertaining to occupational illness and injury are designed to conform to regulations stipulated by the Occupational Safety and Health Administration (OSHA). Therefore, these codes are periodically reviewed and revised by the FRA Railroad Safety Advisory Committee (RSAC). The OSHA Final Rule, which will be effective January 1, 2002, will necessitate revisions of FRA occupational illness and injury codes as well as narratives.

FRA Databases

The FRA Office of Safety Analysis maintains a database for each of the following accident/incident report forms:

- Rail Equipment Accident/Incident (6180.54)
- Highway-Rail Grade Crossing Accident/Incident (6180.57)
- Railroad Injury and Illness Summary (6180.55) and
- Railroad Injury and Illness Summary Cont. Sheet (6180.55a)

Each record possesses fields for the information previously described. The database for Form 6180.54 information derives fatality and injury totals from the Forms 6180.55a submitted, not from the submitted Forms 6180.54. The database for Form 6180.55 uses letters A-J, respectively, to encode the person types of Figure 4 (A – *Worker on duty – employee*, ..., J – *Nontrespasser/off railroad property*). Injury codes are recorded in FRA databases using three fields, two characters for the nature, one character for the major body part and the fourth character (a letter) for the body location. These same three fields are used to record occupational illness. A '9' in the third database field indicates death from illness within one year.

⁹ *ibid.*

Section 3: Commercial Marine

Reportable Fatalities and Injuries

Commercial Shipping Vessels

The applicable regulations for commercial shipping and diving are found in Title 46 of the CFR. Regulations for recreational boating and outer continental shelf (OCS) facilities (e.g., oil platforms) are found in Title 33 of the CFR. Reportable recreational boating casualties are discussed in Section 4 of this report.

The U.S. Coast Guard (USCG) must be informed of every commercial shipping marine casualty. The definition of marine casualty (46 CFR 4.03-1) follows. Note that the definition *includes* death or injury to persons diving from a vessel (part c), yet *excludes* death or injury to persons on a public vessel:

“(a) The term marine casualty or accident shall mean any casualty or accident involving any vessel other than public vessels if such casualty or accident occurs upon the navigable waters of the United States, its territories or possessions or any casualty or accident wherever such casualty or accident may occur involving any United States' vessel which is not a public vessel. (See Sec. 4.03-40 for definition of Public Vessel.)

(b) The term marine casualty or accident includes any accidental grounding, or any occurrence involving a vessel which results in damage by or to the vessel, its apparel, gear, or cargo, or injury or loss of life of any person; and includes among other things, collisions, strandings, groundings, foundering, heavy weather damage, fires, explosions, failure of gear and equipment and any other damage which might affect or impair the seaworthiness of the vessel.

(c) The term marine casualty or accident also includes occurrences of loss of life or injury to any person while diving from a vessel and using underwater breathing apparatus.”

The USCG must be notified immediately of marine events that result in (46 CFR 4.05-1(a)(5) and (a)(6)):

“(5) A loss of life;

(6) An injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties”

Diving events must be reported if they result in (46 CFR 197.484):

“(1) Loss of life.

(2) Diving-related injury to any person causing incapacitation for more than 72 hours.

(3) Diving-related injury to any person requiring hospitalization for more than 24 hours.”

All casualties on vessels, on shore or on facilities¹⁰ must be reported. Not all vessels must report marine casualties stipulated in Title 46 regulations. Vessels for which reporting requirements are stipulated elsewhere in the CFR are recreational vessels, public vessels, and vessels with casualties among shipyard or harbor workers when the death or injury does not involve operation of the

¹⁰ For reporting purposes, the USCG defines a facility as “any non-vessel entity which was the site of a marine casualty.” (Taken from the *Marine Investigations Module Guide*).

vessel or any related equipment. (These latter casualties are subject to OSHA reporting requirements¹¹.)

Offshore Platforms

Outer continental shelf (OCS) facilities, i.e., offshore platforms, must notify the USCG of casualties in the following manner (46 CFR 146.30):

“...(a) The owner, operator, and person in charge of an OCS facility shall ensure that the Coast Guard is notified as soon as possible after a casualty occurs, and by the most rapid means available, of each casualty involving the facility which results in:

(1) Death; or

(2) Injury to 5 or more persons in a single incident.

(b) The owner, operator, and person in charge shall ensure that the Coast Guard is notified promptly of each casualty involving the facility which results in:

(1) Damage affecting the usefulness of primary lifesaving or firefighting equipment;

(2) Injury causing any person to be incapacitated for more than 72 hours;

(3) Damage to the facility exceeding \$25,000 resulting from a collision by a vessel with the facility; or

(4) Damage to a floating OCS facility exceeding \$25,000.”

Marine Safety Information System (MSIS)

The Marine Safety Information System (MSIS) comprises several database modules (called *supplements*), each of which collect specific information about marine casualties and events. An event record begins with the creation of the *Investigation Activity Preliminary Report* (IAPR), which is described as a “scratch pad” in the MSIS manual. Investigators are encouraged to enter partial information and revise supplements as data becomes available over the course of an investigation. From each IAPR, a *Marine Casualty Investigation Report* (MCIR) is generated through the MSIS; the MCIR serves as the primary reporting mechanism for all investigation activities.

Five codes are used in the MSIS to classify marine events¹²:

Code	Name	Explanation
MA	MAJOR	a) Loss of 6 lives or more; or b) Loss of a mechanically propelled vessel of 100 or more gross tons; or c) Property damage initially estimated at \$500,000; or d) “Serious threat” (as determined by COMDT & NTSB) to life, property, or the marine environment by hazardous material.
SE	SERIOUS	Occurrence involving vessels of 1600 gross tons or more that results in the total loss (including constructive total loss) of one or more vessels, or Loss of life on vessels of 500 gross tons or more.
SI	SIGNIFICANT	a) Multiple deaths or single death under unusual circumstances; or

¹¹ See 29 CFR 1904.

¹² A detailed discussion may be found in the Marine Safety Manual, Volume V, paragraph 3.A.5.c.
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		b) Hazard to life, property, or the marine environment; or c) Loss of any inspected vessel; or d) Substantial media interest
PU	<i>PUBLIC/ NONPUBLIC</i>	Public & Non-public vessel casualty with either: \$75,000 in property damage; or at least one fatality
NO	<i>NONE</i>	A pollution incident or marine casualty that does not meet any of the above criteria.

In the IAPR, two types of indicator variables are used to describe casualties: CASUALTY TYPE and INCIDENT STATUS. The investigator selects categories based upon their respective definitions in the CFR (generally, Titles 33 and 46). Figure 6 explains the values of variables CASUALTY TYPE and INCIDENT STATUS.

CASUALTY TYPE values	Explanation
<i>VESSEL</i>	Vessel casualty conforming to 46 CFR 4.
<i>PERSONNEL</i>	Personnel injury casualty conforming to 46 CFR 4 or 33 CFR 140 (platforms).
<i>FACILITY</i>	Casualty on a platform; may be used to indicate inshore marine casualty.
<i>POLLUTION</i>	Involving oil or hazardous materials.
<i>MARPOL</i>	Involving any of the categories of MARPOL ¹³ .

INCIDENT TYPE values	Explanation
<i>VERIFIED</i>	The event has been confirmed and meets at least one reportability criteria.
<i>NOT VERIFIED</i>	Not able to confirm event due to insufficient evidence from the scene.
<i>VERIFIED, NOT REPORTABLE</i>	Event has been confirmed, but does not meet at least one reportability criterion.

Figure 6: IAPR variables categorizing marine casualty.

Within the MSIS, each *verified* reportable casualty must have an associated record in the *Marine Casualty Description Details Supplement* (MCDD) of the MSIS. The MCDD collects data on the environmental factor(s), causal factor(s) and chain of events in a marine casualty.

A *Marine Casualty Personnel Casualty Supplement* (MCPC) is required for every person “*injured, dead, missing, or receives an injury which requires medical*

¹³ MARPOL is the international treaty regulating disposal of waste from ships under normal operating conditions.

*attention beyond that of normal first aid*¹⁴. However, non-accidental deaths (e.g., homicide, suicide, natural death) and injuries (e.g., those sustained in a fight) should *not* be submitted to the MSIS. Persons missing at sea are reported following procedures of accidental death.

The MCPC employs 2-, 3- and 4- character codes to record characteristics of an injury. Figure 7 illustrates MCPC injury codes.

Name	Number of Codes	Explanation
Status	16	Person's job title or relationship to the event (e.g., passenger).
Type of Accident	23	Activity that contributed to the injury.
Body Part Affected	21	e.g., Knee, Stomach
Resulting Injury	24	e.g., Flash Burn, Concussion

Figure 7: Injury codes of the MCPC.

¹⁴ Marine Investigations Module Guide for the MSIS (p. 84).
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Section 4: Recreational Boating

Reportable Fatalities and Injuries

Casualty reporting for recreational vessels and vessels that must be registered is regulated by 33 CFR 173. Boating operators must submit a report to the proper state authorities¹⁵, which in turn must forward the report to the Coast Guard within 30 days of the event. This report must be submitted whenever (33 CFR 173.55):

- “... (1) A person dies;*
- (2) A person is injured and requires medical treatment beyond first aid;*
- (3) Damage to the vessel and other property totals more than \$500 or there is a complete loss of the vessel; or*
- (4) A person disappears from the vessel under circumstances that indicate death or injury.”*

The same regulation specifies the timeframe for submitting the initial report:

- “...(b) A report required by this section must be made:*
- (1) Within 48 hours of the occurrence if a person dies within 24 hours of the occurrence;*
- (2) Within 48 hours of the occurrence if a person is injured and requires medical treatment beyond first aid, or disappears from a vessel; and*
- (3) Within 10 days of the occurrence or death if an earlier report is not required by this paragraph.*
- (c) When the operator of a vessel cannot submit the casualty or accident report required by paragraph (a) of this section, the owner shall submit the casualty or accident report.”*

USCG regulations mandate inclusion of every reportable casualty on a *Boating Accident Report*, Coast Guard Form CG-3865¹⁶. For the purposes of that form, a boating accident is defined as an occurrence that results in:

- “... a) Loss of life or disappearance of any person overboard under circumstances that indicate the possibility of death or injury;*
- b) Injury that requires medical treatment beyond first aid; or*
- c) Damage to the vessel or its equipment, or other vessels, or other property in excess of \$200, or disappearance of the vessel other than by theft.”*

The *Boating Accident Report* asks for *Number of Persons On Board*, (including towed skiers) but does not provide any entries for recording casualty totals or injury severities. However, minimum reporting requirements stated in 33 CFR 173.57 require an accident report list persons killed or injured, the cause of each death and the nature and extent of each injury. An examination of casualty fields within the Boating Accident Report Database (BARD) was not possible; the

¹⁵ Required entries for state boating accident reports are specified in 33 CFR 173.57.

¹⁶ Instructions for CG-3865 specify that reports are not desired unless the casualty or accident meet the reporting criteria of 46 CFR 4.05-1 or 33 CFR 173.55.

BARD is temporarily disabled on the BTS website for revisions and is unavailable on the USCG Office of Boating Safety website.

Section 5: Highway

Model Minimum Uniform Crash Criteria

Background

Two acts of legislation, the 1991 *Intermodal Surface Transportation Efficiency Act* (ISTEA) and the 1998 *Transportation Equity Act for the Twenty First Century* (TEA21) mandated the Secretary of Transportation recommend standards and minimum criteria for reporting highway crashes. The TEA21 renewed the mandates of the ISTEA and provided financial incentives to the states to develop implementation plans. (In responding to the language of the ISTEA, states responded that they approved of standards in concept, but not as regulatory requirements.) Published in 1998¹⁷, The Model Minimum Uniform Crash Criteria (MMUCC) – sponsored by the NHTSA, FHWA and National Association of Governors' Highway Safety Representatives (NAGSR) – satisfies the TEA21 requirement for minimum standards. The MMUCC is a voluntary standard; state regulations will govern data collection with no requirements from NHTSA or FHWA. The only exceptions are those data elements required by the Office of Motor Carriers¹⁸.

The MMUCC follows existing data collection standards for crashes, such as ANSI D16.1, the Fatality Analysis Reporting System (FARS) and the General Estimates System (NASS GES). National standards, including those suggested in the MMUCC, are not uniformly implemented across the 50 States; inconsistencies exist even between a State's agencies. Data elements of the MMUCC are defined as a) recorded directly on the crash report, b) derived from data elements previously recorded in a database or c) linked to other data sources. Linking of data elements is achieved after the data file for the crash report has been cross-referenced to relevant injury, licensing and roadway description data files.

Significant sources of crash data inconsistencies are each state's crash reporting criteria and thresholds. Threshold definitions are very diverse, but reporting limitations can be broadly divided into three categories:

- *Type of road* – many states restrict reporting to crashes on public roads, and exclude accidents in driveways and parking lots.
- *Property/Vehicle damage* – most states report only those crashes resulting in excess of \$500-\$1,000 damage. Thus, fender benders are excluded. Large states typically have higher damage limits or restrict crash reports to those where at least one vehicle had to be towed from the scene.

¹⁷ And endorsed by the National Safety Council (NSC) Traffic Records Committee in 1997.

¹⁸ The OMC is now the Federal Motor Carrier Safety Administration (FMCSA). None of the fields required for motor carriers are related to accidental death or injury. Examples of fields required by the FMCSA are: *Carrier Name*, *GVW Rating of Power Unit* (tractor) and *Hazardous Material Placard* (yes/no).

- *Presence of injury* – most states report crashes involving an injury, described via an injury scale. Some states do not report uninjured passengers to save money and time.

Reportable Crashes

The MMUCC proposes the following uniform crash reporting criteria:

“As a minimum, states should collect data for motorists, injured and uninjured, and for non-motorists involved in crashes in which at least one vehicle is disabled by damage severe enough to prevent driving it.”

Fatalities and Injuries

For every person involved in a crash, the MMUCC defines *Person Type* and *Injury Status*. The variable *Injury Status* encodes injury severity following the KABCO scheme found in the NHTSA Fatality Analysis Reporting System (FARS). Figure 8 lists the respective values of *Person Type* and *Injury Status*.

Data Element Name	Element Codes
Person Type	Driver Passenger Non-motorist Not reported Unknown
Injury Status	Fatal Injury (K) Nonfatal Injury Incapacitating (A) Non-incapacitating (B) Possible (C) No injury (O) Not reported Unknown

Figure 8: MMUCC *Person Type* and *Injury Status* data element codes

Non-motorists involved in an accident are further subdivided by the data element *Non-motorist Type*. The MMUCC defines six (6) *Non-motorist Type* codes:

- *Pedestrian*,
- *Pedalcyclist (bicycle, tricycle, unicycle, pedal car)*,
- *Skater*
- *Other non-motorist (wheelchair, etc.)*
- *Not reported*
- *Unknown*

The MMUCC defines two data elements to further distinguish injured persons, *Injury Area* and *Injury Description*. *Injury Description* is a narrative field. The MMUCC defines *Injury Area* as “the primary or most obvious area of the person’s body injured during the crash.” The major areas defined by the MMUCC that are subject to injury are:

- Head

- Face
- Neck
- Thorax (chest)
- Abdomen and pelvis
- Spine
- Upper extremity
- Lower extremity
- Unspecified

For vehicle occupants and non-motorists, data elements are defined to record the vehicle or personal safety protection system/equipment used. The data element *Transported to Medical Facility By* is defined to facilitate data links to Emergency Medical Services (EMS) databases. Subfields of this data element include: *EMS Response Agency Identifier*, *EMS Response Run Number* and *Medical Facility* which are all standard identification numbers and report codes.

Crash Severity

Certain crash-related data elements are derived; they are not collected at the crash scene, but are extracted from information previously captured in the accident reporting database.

The *Crash Severity* data element is derived from the *Injury Status* data element. *Crash Severity* reflects only the most severe injury to any person involved in the crash. The MMUCC defines five (5) *Crash Severity* codes:

- *Property-damage-only (none injured)*
- *Nonfatal injury*
- *Fatal injury*
- *Not reported*
- *Unknown*

Several derived data elements count persons, fatalities and injuries (Figure 9).

Derived Data Element	Derivation
<i>Number of Motorists</i>	Count motorists using vehicle number and seating position data elements.
<i>Number of Non-motorists</i>	Count the number of unique MMUCC identifiers assigned to non-motorist records.
<i>Total Non-fatal Injuries</i>	Derived from Injury Status elements.
<i>Total Fatalities</i>	Derived from Injury Status elements.

Figure 9: MMUCC derived data elements counting persons

The MMUCC counts – for both motorists and non-motorists – deaths within 30 days of injuries sustained during the crash.

Database Injury Severity Scales

Both the National Automotive Sampling System (NASS) General Estimates System (GES) and Fatality Analysis Reporting System (FARS) employ the

KABCO injury coding scheme. The eight (8) injury severity values (defined in both the 1998 GES Coding Manual and 1999 Analytical User's Manual) are very similar to the KABCO scheme suggested by the MMUCC (Figure 10):

Value	Severity
0	<i>No Injury (O)</i>
1	<i>Possible Injury (C)</i>
2	<i>Nonincapacitating Evident Injury (B)</i>
3	<i>Incapacitating Injury (A)</i>
4	<i>Fatal Injury (K)</i>
5	<i>Injured, Severity Unknown</i>
6	<i>Died Prior to Accident</i>
9	<i>Unknown</i>

Figure 10: NASS GES Injury Coding Scheme (KABCO)

Crashes recorded in FARS must result in at least one fatality within 30 days of the accident. The FARS *Injury Severity* field contains a KABCO value. An additional indicator variable *Fatal Injury At Work* records whether the fatal injury was sustained during the person's work hours. A NASS GES *Injury Severity* field corresponds to the *most severe* injury sustained in the given accident.

The Federal Motor Carrier Safety Administration (FMCSA) records injury severity using the 1990 version of the Abbreviated Injury Scale (AIS), discussed in detail in Section 8.

Section 6: Pipeline

Reportable Fatalities and Injuries

Gas Pipelines

Casualty reporting for gas pipelines is regulated by 49 CFR 191. Certain offshore gas pipelines, all onshore gas pipelines not within any city, town or village limits and all gas pipelines on residential or commercial property are excluded from incident reporting regulations (49 CFR 191.1(b)). Gas pipelines are categorized as either “*distribution systems*” or “*transmission and gathering systems*”.

All events meeting the following definition of a gas pipeline incident must be reported within 30 days of detection:

“(1) An event that involves a release of gas from a pipeline or of liquefied natural gas or gas from an LNG facility and

- (i) A death¹⁹, or personal injury necessitating in-patient hospitalization; or*
- (ii) Estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more.*

(2) An event that results in an emergency shutdown of an LNG facility.

(3) An event that is significant, in the judgement of the operator, even though it did not meet the criteria of paragraphs (1) or (2).”

For any reportable incident, the operator must notify the Office of Pipeline Safety (OPS) immediately by telephone (49 CFR 191.5). Incidents involving gas distribution systems are reported on Form RSPA F 7100.1; those involving transmission and gathering systems are reported on Form RSPA F 7100.2. Both forms provide fields to record the total number of fatalities and the total number of injuries requiring inpatient hospitalization²⁰. Gas pipeline regulations require operators to submit supplementary reports as new information is obtained, but submission timelines are at the discretion of the operator.

Records in gas pipeline incident data files (available for download from the OPS website) reflect information gathered on incident forms; files possess fields for the total number of fatalities and injuries sustained in the incident. Neither the forms 7100.1/2 nor the data records reflect injury severities or locations on the body.

¹⁹ The regulations do not specify a time period (e.g., 30 days) since the incident during which fatal injuries are counted as deaths.

²⁰ Instructions for the respective forms define inpatient hospitalization as “...admission and confinement in a hospital beyond treatment administered in an emergency room or out-patient clinic in which confinement does not occur.”

Liquid Pipelines

Casualty reporting for hazardous liquid pipelines is regulated by 49 CFR 195. Several types of hazardous liquid pipeline (e.g., using gravity to transport liquids, supply pipelines to facilities not crossing waterways) are excluded from these criteria in 49 CFR 195.1.

Liquid pipeline accidents meeting the following definition must be reported within 30 days of detection (49 CFR 195.50):

"An accident report is required for each failure in a pipeline system subject to this part in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:

- (a) Explosion or fire not intentionally set by the operator.*
- (b) Loss of 50 or more barrels (8 or more cubic meters) of hazardous liquid or carbon dioxide.*
- (c) Escape to the atmosphere of more than 5 barrels (0.8 cubic meters) a day of highly volatile liquids.*
- (d) Death of any person.*
- (e) Bodily harm to any person resulting in one or more of the following:*
 - (1) Loss of consciousness.*
 - (2) Necessity to carry the person from the scene.*
 - (3) Necessity for medical treatment.*
 - (4) Disability which prevents the discharge of normal duties or the pursuit of normal activities beyond the day of the accident.*
- (f) Estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding \$50,000."*

Requirements for immediate OPS notification of an accident with casualties are slightly different than this definition. A pipeline operator must notify the OPS immediately by telephone of any accident that *"...caused the death or a personal injury requiring hospitalization..."* (49 CFR 195.52). (By contrast, *all* gas pipeline incidents must be reported immediately.) Accidents involving hazardous liquid pipelines are reported on DOT Form 7000-1. The form provides fields to record the total number of fatalities and the total number of injuries²¹. Liquid pipeline regulations require operators to submit supplementary reports within 30 days of changes or additions to accident information.

Records in liquid pipeline accident data files (available for download from the OPS website) reflect information gathered on accident forms; files possess fields for the total number of fatalities and injuries, categorized by operator employees and non-employees. (By contrast, gas pipeline casualties are total killed/injured.) Neither the form 7000-1 nor database records reflect injury severities or locations on the body.

²¹ 49 CFR 195 does not define "injury" or "medical treatment". Nor do these regulations specify a time period (e.g., 30 days) since the incident during which fatal injuries are counted as deaths

Section 7: Transit

Reportable Fatalities and Injuries

Commuter and public rail²² accidents meeting the following definition (49 CFR 659.5) must be reported by the transit agency to the designated state oversight agency:

“Accident means any event involving the revenue service operation of a rail fixed guideway system if as a result:

- (1) An individual dies;*
- (2) An individual suffers bodily injury and immediately receives medical treatment away from the scene of the accident; or*
- (3) A collision, derailment, or fire causes property damage in excess of \$100,000.”*

This definition includes suicides and attempted suicides. Timetables for reporting transit accidents are set by the state oversight agency, not the Federal Transit Authority (FTA) (49 CFR 659.39). Vehicle and passenger accidents and collisions are defined in the *1999 Safety Management Information Statistics (SAMIS) Annual Report*:

Accident, Passenger

An incident involving a moving vehicle. Includes collisions with another vehicle, object or person (except suicides) and derailment/left roadway. This also includes Personal Casualties incidents on the vehicle and entering/exiting the vehicle.

Accident, Vehicle

An incident involving a moving vehicle. Includes collisions with another vehicle, object, or person (except suicides) and derailment/left roadway.

Collision

With Vehicle

An incident in which a transit vehicle strikes or is struck by another vehicle. Reports are made if the accident results in death, injury, or property damage over \$1,000.

With Object

An incident in which a transit vehicle strikes an obstacle other than a vehicle or person (e.g., building, utility pole). Reports are made if the accident results in a death, injury, or property damage over \$1,000.

With People

An incident in which a transit vehicle strikes a person. Except where specifically indicated, collisions with people do not include suicide attempts. Reports are made if the incident results in death, injury, or property damage over \$1,000.

The FTA Report to Congress *Review of the National Transit Database* (2000) discusses shortcomings with existing accident and casualty reporting criteria across FTA programs. For example, FTA regulations for rail transit oversight incorporate a damage threshold of \$100,000 to *any* property; regulations for programs involving drug and alcohol use *exclude* property damage from the

²² More precisely, *rail fixed guideway systems* are defined (49 CFR 659.1) and regulated.
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transit accident definition. (Alcohol and drug regulations define *accident* in terms of damage severity to the transit vehicle – whether or not it had to be towed from the scene or was removed from service.) In its *Review of the National Transit Database*, the FTA endorses a uniform FTA (and DOT) standard for reporting events and casualties. Specifically, the FTA makes the following recommendations to modify accident reporting criteria for the National Transit Database (NTD):

- The NTD “*should define two tiers of accidents*”. The FTA recommends that fatalities and other “major accidents” be reported on more descriptive forms that would cover causal factors and equipment failures.
- The FTA must adopt consistent definitions of accidents and incidents across the agency’s programs.
- Accident reports should be submitted to the FTA “*within 30 calendar days after the close of the previous month*” (similar to FRA reporting requirements).
- All fatal accidents should be reported to the FTA “*by 9:00 am EST on the workday following an accident.*” The FTA would design and distribute accident short forms for this purpose. The FTA would establish other deadlines to ensure prompt reporting of additional information during the course of an investigation.

FTA regulations mandate transit agencies submit detailed reports of events and casualties to the state oversight agency, yet such reporting to the FTA is voluntary²³. (Currently, transit agencies are required only to submit an annual report of financial, safety and security data within 120 days of the fiscal year just completed.)

National Transit Database

The FTA’s National Transit Database (NTD) data tables report the number of fatalities and injuries across the twelve modes²⁴ during the previous fiscal year. Reported fatalities are confirmed within 30 days of an event (including collisions, derailments and non-arson fires). In the NTD, injury is defined as “...*any physical damage or harm to a person requiring medical treatment or any physical damage or harm to a person reported at the time and place of occurrence.*” Note that this definition encompasses more events than those stipulated in 49 CFR 659.5, the FTA’s rail accident reporting criteria.

NTD casualty data tables report injuries and fatalities among transit patrons, employees and “other” persons. Collisions include grade crossing accidents and attempted/successful suicides. Besides derailments/buses leaving the road and non-arson fires (in vehicles, stations or elsewhere), the NTD counts casualties from several “personal casualty” events occurring:

- In parking facilities

²³ Review of the National Transit Database, May 2000 Section 4.2.

²⁴ The twelve modes are defined in the 1999 SAMIS Annual Report.

- Inside vehicles
- On Right of Ways
- While Boarding/Alighting
- In stations/At bus stops

The NTD property damage threshold of \$1,000 for incidents is far lower than that stipulated in 49 CFR 659.5 for rail accidents (\$100,000). Furthermore, this \$1,000 is limited to transit-owned property and vehicles, not any property. In conjunction with a broader definition of injury, casualty data for rail accidents in the NTD are inconsistent with FTA reporting criteria.

In its 2000 *Review of the National Transit Database*, the FTA recommends casualties be tabulated for a fourth category of persons – *trespassers* – because “...a significant number of injuries and fatalities...result from persons who have deliberately broken laws or system rules and have consequently placed themselves at a higher risk.” Furthermore, the FTA recommends the NTD distinguish between suicides, fires, rail-crossing incidents and accidents involving transit-owned vehicles and the same events involving municipal vehicles.

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Section 8: Non-DOT Injury Severity Scales

Abbreviated Injury Scale

Originally introduced in 1969, and revised in 1990 to its current form, the Abbreviated Injury Scale (AIS) comprises integer scores of increasing severity (Figure 11)²⁵. Injuries scored '1' through '5' are survivable; injuries scored '6' are not. The scale is nonlinear; that is, the magnitude between severity '1' and '2' injuries is not identical to the magnitude between severity '5' and '6' injuries.

Injury	AIS Score
1	<i>Minor</i>
2	<i>Moderate</i>
3	<i>Serious</i>
4	<i>Severe</i>
5	<i>Critical</i>
6	<i>Unsurvivable</i>

Figure 11: The Abbreviated Injury Scale (AIS)

Use by Modal Agencies

Some DOT modal agencies are adopting the AIS method for recording injuries in a database. The FMCSA employs the 1990 AIS on the Occupant Injury Form (HS Form 433B). FARS and GES KABCO injury scores are converted into AIS scores using a two-dimensional matrix of conversion factors²⁶. All available documentation implies the FARS and NASS GES use the KABCO system. It is unclear whether one or both has adopted the AIS scheme. Two NHTSA databases, the Crashworthiness Data System (CDS) for new car investigations and the Special Crash Investigation (SCI) tool for fatalities caused by airbags (exclusively in cars equipped with multi-stage airbags and event recorders) do employ the AIS. For every vehicle occupant, the SCI records injured body region and AIS severity. Much more detailed injury information is collected only for the occupant suffering the fatal airbag injury.

The USCG plans to adopt the AIS beginning in September 2001. However, the AIS will only be applied to new casualty reports. All prior injury records will not be converted to the AIS; older reported injuries will retain the MSIS coding scheme (Section 3).

²⁵ The scoring system is monitored by a committee of the Association for the Advancement of Automotive Medicine.

²⁶ The conversion technique is detailed in the NHTSA Report *Ejection Mitigation Using Advance Glazing Status Report II*, August 1999, p. 33ff.

Organ Injury Scales

The American Association for the Surgery of Trauma has maintained an injury scoring system for vital organs since 1987. These Organ Injury Scales (OIS), one per organ, are score '1' through '6'. As with the AIS, OIS injuries that are scored '1' through '5' are survivable, injuries scored '6' are not. The organs subject to injury are:

- Thoracic Vascular
- Lung
- Heart
- Chest Wall
- Diaphragm
- Spleen
- Liver
- Abdominal Vascular
- Kidney
- Ureter
- Bladder
- Urethra

Organ injuries are assigned a Grade (I through V) and a range of appropriate AIS scores based on the medical description. For example, a Chest Wall injury described as a "fracture involving a unilateral flail chest of at least three ribs" is considered a Grade IV injury associated with an OIS score of '3' or '4'.

It does not appear that any DOT modal agency has adopted the OIS scheme.

Conclusions

A survey of accident, incident and crash databases by transportation mode illustrates a wide variety of casualty reporting criteria and conventions. Not every Federal agency even has mandatory reporting criteria. Reporting information on specific roadway crashes and mass transit accidents/incidents is *required* to state authorities, but is *voluntary* to the respective Federal agencies. (The FHWA, NHTSA and FTA all have proposed standards, but do not yet have the regulations mandating them.) Some consistencies in reporting criteria (with notable exceptions) are evident among the modes.

Some types of events must always be reported; most obviously, those associated with the operation of a vehicle/pipeline in which a person is killed at the scene. Yet, Coast Guard and FRA regulations provide for exclusions and the NTSB/FAA label every fatality during flight as accidents. The FRA requires every accident/incident at a highway-rail grade crossing be reported, regardless of casualties or damage extent.

Criteria stipulate injuries requiring medical treatment beyond first aid and/or hospitalization. However, modal definitions of “medical treatment” differ in the procedures considered and lengths of hospital stay.

Reporting criteria incorporate levels of property damage. Of course, the monetary levels are never identical. (In the case of the FTA, damage amounts differ between the agency’s programs.) Only the FAA and NTSB do not rely on monetary damage levels, relying instead on the definition of “substantial damage”.

Among the most basic differences in reporting is the time elapsed for a death to be counted as accident-related. Transit, highway and aviation agencies count fatal injuries within 30 days of the accident. Yet, the FRA counts all deaths within one year (365 days) and neither marine nor pipeline regulations specify such time periods.

While most modal agencies attempt to collect statistics on total persons affected (the exceptions being the FTA and OPS), categorization of people varies widely. FAA, Coast Guard, OPS and FTA databases all use broad categories, essentially distinguishing between crew/employees and passengers/others. (However, FAA and NTSB employ very specific codes to describe persons involved in accidents/incidents.) The FRA and NHTSA have very specific categories, relating each person to their job function or potential role in the accident. Neither the NTSB database nor the Boating Accident Report Database (BARD) reports statistics by person type; this information is available only through report narratives.

Injury severity conventions represent some of the greatest diversity between the modes. Methods include: counting solely in the aggregate (OPS, FTA, USCG for

Appendix A – Aviation

FAA and NTSB Accident/Incident Forms

NTSB Pilot/Operator Aircraft Accident Report (6 pgs.) and instructions

FAA Accident/Incident Report Form 8020-23 and instructions

FAA Report of Aircraft Accident Form 8020-6 and instructions

FAA Report of Aircraft Accident (Cont. Sheet) Form 8020-6-1 and instructions

Appendix B – Railroad

FRA Accident/Incident Forms and Injury/Illness Forms

FRA Factual Railroad Accident Report Form FRA F 6180.39 (6 pgs)

Federal Accident Notification Form FRA F 6180.41

Rail Equipment Accident/Incident Report Form FRA F 6180.54

Railroad Injury and Illness Summary Form FRA F 6180.55

Railroad Injury and Illness Summary (Cont. Sheet) Form FRA F 6180.55a

Annual Railroad Report of Employee Hours and Casualties, by State Form FRA F 6180.56

Highway-Rail Grade Crossing Accident/Incident Report Form FRA F 6180.57

US DOT FRA Violation of Accident/Incident Reporting Rules Form FRA F 6180.61

Employee Human Factor Attachment Form FRA F 6180.81 and instructions

Initial Rail Equipment Accident/Incident Record Form FRA F 6180.97

Railroad Employee Injury and/or Illness Record Form FRA F 6180.98

FRA Injury and Illness Codes

Appendix C – Marine

US Coast Guard Marine and Boating Accident/Incident Forms

Boating Accident Report Form CG-3865 and instructions

Report of Marine Accident, Injury or Death Form CG-2692 and instructions

Barge addendum Form CG-2692A

Report of Required Chemical Drug and Alcohol Testing Following a Serious Marine Incident Form CG-2692B and instructions

Appendix C – Marine

US Coast Guard Marine and Boating Accident/Incident Forms

Boating Accident Report Form CG-3865 and instructions

Report of Marine Accident, Injury or Death Form CG-2692 and instructions

Barge addendum Form CG-2692A

Report of Required Chemical Drug and Alcohol Testing Following a Serious Marine Incident Form CG-2692B and instructions

Appendix D – Pipeline

RSPA Gas and Liquid Pipeline Incident Forms

Accident Report – Hazardous Liquid Pipeline Form DOT 7000-1 and instructions

Incident Report – Gas Distribution System Form RSPA 7100.1 (4 pgs) and instructions (6 pgs)

Incident Report – Gas Transmission and Gathering Systems Form RSPA 7100.2 (3 pgs) and instructions (6 pgs)

Appendix E – Highway

FARS Data Elements

NASS GES Data Elements and Technical Notes

KABCO Injury Severity Scoring