ISS-2: THE INTEGRATION OF THE MOTOR CARRIER SAFETY STATUS MEASUREMENT SYSTEM (SAFESTAT) INTO THE ROADSIDE INSPECTION SELECTION SYSTEM (ISS)

FINAL REPORT

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TABLE OF CONTENTS

ABSTRACT

The original roadside Inspection Selection System (ISS) was developed in response to a 1995 Congressional mandate. This mandate called for the use of prior carrier safety data to guide the selection of commercial vehicles and drivers for roadside inspections.

As the ISS has undergone development, another project also has been evolving. This project involves the creation of a Performance and Registration Information Systems Management (PRISM) program. An objective of PRISM is to identify relatively unsafe carriers, through an assignment of a Safety Status Measurement System (SafeStat) score, and encourage them to improve their safety performance or risk having their registration privileges revoked.

While SafeStat was designed to prioritize carriers for monitoring and compliance reviews, the ISS was designed to prioritize carriers for roadside inspection. However, both algorithms use similar data to define a relatively "unsafe" carrier. It would be beneficial if there could be one uniform motor carrier rating system in place for all of the Federal Motor Carrier Safety Administration's programs. This paper briefly describes the two algorithms, discusses the integration of the SafeStat algorithm into the ISS, and presents conclusions of the initial testing of the resulting system, ISS-2.

An analysis of more than 213,000 roadside inspections reveals that ISS-2 is just as effective as the original ISS in meeting the goals it was designed for. It successfully identifies, and prioritizes for roadside inspection, vehicles and drivers of carriers with poor prior safety performance, as well as those with few or no previous inspections. In addition, safety inspectors testing the system are pleased with the new algorithm and the new features present in ISS-2.

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INTRODUCTION

The roadside Inspection Selection System (ISS) was developed in response to a 1995 Congressional mandate. This mandate called for the use of prior carrier safety data to guide the selection of commercial vehicles and drivers for roadside inspections. Development of the system has been a cooperative effort between the Upper Great Plains Transportation Institute, the Federal Motor Carrier Safety Administration (FMCSA) (formerly the Office of Motor Carriers); and FMCSA's Field Systems Group, and representatives from many states involved in the Roadside Technology Technical Working Group. The ISS is designed to help better distribute roadside inspections among motor carriers, and to target those with prior poor safety performance (*1*).

The ISS normally is installed on hand-held pen notebook or laptop computers utilizing the driver/vehicle inspection software entitled ASPEN. The inspector uses this computer and software to help him/her conduct a roadside inspection. Alternatively, a stand-alone version of the ISS allows the same information to be obtained from desktop or laptop computers that are not using ASPEN.

Ideally, when an inspector is ready to conduct an inspection, he/she will rate several vehicles with ISS inspection values, and then select the vehicle/driver with the highest value to inspect. This is feasible in areas such as weigh stations where commercial vehicles may be waiting in a line to be weighed. The inspector rates vehicles simply by entering the DOT or ICC number usually found on the side of the vehicle into the ISS software. The computer then displays the carrier's name, address, and current ISS inspection value. A recommendation also is given (for example, a carrier with an ISS value of 98 would be strongly recommended for

inspection, while for one with a value of 72, it would be suggested that resources could be better used on another vehicle/driver).

The final decision regarding selection of a vehicle or driver for inspection is left to the individual inspector. Selection also could occur if there was an obvious defect present. Similarly, a vehicle with a valid Commercial Vehicle Safety Alliance sticker probably would not be selected. Even in areas where the ISS selection process is not feasible, the ISS still is useful to automatically fill in the carrier name and address and give particular recommendations.

As the ISS has undergone development, another related project also has been evolving. This project involves the creation of a Performance and Registration Information Systems Management (PRISM) program. An objective of PRISM is to identify carriers with poor safety performance relative to other carriers, and encourage them to improve their safety performance or risk having their registration privileges revoked. The initial step in this process is to assign a Safety Status Measurement System (SafeStat) score using data obtained from roadside inspections, compliance reviews, accidents, etc. Depending on this score, it will either lead to a warning letter stating the carrier will be evaluated over a six-month period for improvement and/or an on-site compliance review (*2*). The ISS supports PRISM/SafeStat by assigning an ISS inspection value of 100 to carriers currently in the monitoring process to prioritize them for roadside inspections.

While SafeStat was designed to prioritize carriers for monitoring and compliance reviews, the ISS was designed to prioritize carriers for roadside inspection. However, both algorithms use similar data to define a relatively "unsafe" carrier. Thus, it is conceivable that a carrier could be rated as "safe" in one system, but "unsafe" in the other. Therefore, it would be beneficial if there could be one uniform motor carrier rating system in place for all of FMCSA's

programs. This paper briefly describes the two algorithms; discusses the integration of the SafeStat algorithm into the ISS; and presents the conclusions of the initial testing of the resulting system, ISS-2.

DESCRIPTION OF THE ORIGINAL ISS AND THE SAFESTAT ALGORITHMS

Although a detailed description of the original ISS and the SafeStat algorithms will not be provided here, a review of the data each uses and the general makeup of the algorithms will be discussed for clarification purposes. The reader is referred to references (*1*) and (*2*) for more detailed descriptions.

Original ISS Algorithm

In terms of data, the original ISS algorithm simply uses the overall safety compliance fitness rating of the carrier, if available within the previous five years; the out-of-service (OOS) results and the number of roadside inspections conducted on the carrier in the previous two years; and the size of the carrier, either number of drivers and/or number of power units. In addition, carriers are identified that currently are in the PRISM monitoring process as described above.

With regards to the general makeup of the original ISS algorithm, carriers receive the highest ISS inspection value possible (i.e., 100) if they are currently in the PRISM monitoring process or have a recent unsatisfactory safety compliance fitness rating. They also will receive higher inspection values if their vehicle and/or driver OOS rates are higher than average compared to the nationwide distribution of OOS rates for their size. In addition, to meet the other main goal of the ISS, carriers with fewer than three roadside inspections in the previous two years, or low inspection rates for their size, also receive higher inspection values (*1*).

The inspection values in the original ISS range from 50 to 100 and are not evenly distributed among carriers. Approximately half of all carriers receive a value of 90 to 100, with an inspect recommendation; 40 percent receive a value of 80 to 89, with an optional recommendation; and 10 percent receive a value of 50 to 79, with a pass recommendation. It should be noted that although only 10 percent of carriers receive a pass recommendation, this corresponds to approximately one-third of the commercial vehicles registered in the Motor Carrier Management Information System (MCMIS) at FMCSA headquarters in the Department of Transportation. One reason for this is that many of the larger carriers have exemplary safety records and subsequent lower inspection values.

SafeStat Algorithm

In comparison, the SafeStat algorithm uses data from roadside inspections and compliance reviews of carriers, and uses carrier-descriptive data for normalization. However, it uses more detailed data such as the number and/or the extent of any violations found. In addition, SafeStat uses information from closed enforcement cases and state-reported commercial vehicle crash data (*2*).

In general, the algorithm works by first determining measures that quantify the performance of a particular carrier (for example, one measure could be their accident rate). It then uses these measures to calculate indicators. The indicator assigns a percentile rank from 0 to 100 to the carrier's performance relative to other carriers. Only carriers with sufficient data in an area will receive an indicator for that area. Relevant indicators then are combined to determine one of four Safety Evaluation Area (SEA) values, which also range from 0 to 100. The four SEAs are accident, driver, vehicle, and safety management. To receive a SafeStat score, and be

identified for the PRISM monitoring process, a carrier must receive a value from 75 to 100 in at least two SEAs. These values are then weighted and added to determine the final SafeStat score. This final score can range between 150 and 550 (*2*).

INTEGRATION PROCEDURE

As alluded to in the introduction, the main impetus behind integrating the SafeStat algorithm into the ISS was to ensure that motor carriers are rated or ranked similarly in all of FMCSA's safety programs. This would guarantee consistency in which motor carriers were targeted for safety reasons. In addition, it was believed that the additional data included in the SafeStat algorithm, such as accident information, would further aid the ISS in focusing inspection resources.

Although, as described above, there are some differences in the exact type and extent of data used in the algorithms, it was still expected that all the carriers which received a final SafeStat score would be ranked relatively high in the original ISS, i.e., values of 80 to 100. From analysis conducted by the author in February 1997, it was determined that this was the case for the vast majority of the carriers. Any discrepancies that occurred could be explained either by the difference in the time frame of data used for each algorithm, i.e., SafeStat uses 30 months of data and the original ISS uses 24 months; or from the fact that accident information is not used in the original ISS. Overall, the two algorithms correlated quite well. Still, it was preferred that a perfect correlation should exist to ensure that *all* carriers were rated consistently.

Because SafeStat is continually being revised and updated based on new information and testing results, it was desired that the newly developed ISS-2 algorithm be constructed in such a way as to automatically change along with SafeStat. Thus, rather than examine components at

the measure or indicator level of SafeStat (where the most changes occur), it was decided to use the data from SafeStat either at the SEA level or at the final SafeStat score level.

Initial consideration was given to simply using the final SafeStat score in the ISS-2. This idea was discarded for two reasons. First, the final SafeStat score is only given to the "worst of the worst" carriers, whereas the goal of ISS is to identify the good safety performers and the bad. And, second, less than 1 percent of carriers registered in the MCMIS database receive a SafeStat score, and it was desired to rate as many carriers based on safety data as possible.

Once it was decided to use data from SafeStat at the SEA level, an initial analysis showed that 16 percent of all carriers in the MCMIS database had enough safety data to receive at least one SEA value (this corresponded to about 64 percent of all vehicles in the database). Working with the designers of the SafeStat algorithm at the Volpe National Transportation Systems Center; the ISS-2 safety algorithm was designed to weight, rank, and combine the SEA values of carriers to be perfectly consistent with SafeStat. Therefore, *all* carriers that are ranked as relatively unsafe in SafeStat also are ranked as such in ISS-2. Refer to Appendix 1 for a detailed description of the ISS-2 safety algorithm.

The ISS-2 safety algorithm outputs values from 1 to 100 that are evenly distributed among carriers, i.e., approximately half of all carriers with sufficient safety data have values above 50 and half of all these carriers have values below 50. Thus the inspection recommendations in ISS-2 are based on different value ranges than they are in the original ISS, which only has an output value range of 50 to 100. In ISS-2, carriers with values of 75 to 100 are given an inspect recommendation, carriers with values of 50 to 74 are given an optional recommendation, and carriers with values of 1 to 49 are given a pass recommendation. As with

the original ISS, carriers that are in the PRISM monitoring process are given an inspection value of 100.

To meet the other main goal of the ISS, to target carriers for roadside inspection which have insufficient safety data, concepts from the original ISS algorithm were incorporated into the ISS-2 insufficient data algorithm. Basically, if a carrier does not receive a score from the ISS-2 safety algorithm, it is assigned an ISS-2 value from 50 to 100 based on its inspection rate, i.e., the number of applicable roadside inspections per vehicle and/or driver, relative to other carriers. If a carrier has had zero roadside inspections in the previous 30 months, it is assigned an ISS-2 value of 94 to 100 based only on its size. Refer to Appendix 1 for a detailed description of the ISS-2 insufficient data algorithm.

Thus, as developed, the ISS-2 is actually comprised of two algorithms: a safety algorithm, based on SafeStat SEA level data; and an insufficient data algorithm for carriers without enough safety data. In the original ISS, safety and insufficient data were combined into one algorithm; however, as described above, in ISS-2 they are kept separate. Therefore, a carrier only falls into either the safety algorithm or the insufficient data algorithm; and *every* carrier in the MCMIS database receives an ISS-2 value. When the ISS-2 inspection value is displayed, there is an accompanying message that states whether the inspection value is based on SafeStat data, lack of safety performance data, or PRISM. Refer to Appendix 2 for a "look" at the ISS-2 as prepared by the FMCSA Field Systems Group.

Once the development of the ISS-2 algorithm was completed, states were contacted to assess interest in testing the new system. The states of Connecticut, Iowa, North Dakota, New York, and Washington all agreed to participate in the testing. Later, California and Texas also expressed interest in participating.

The FMCSA Field Systems Group completed coding of the algorithm and development of the new software for ISS-2 in the fall 1998. A demonstration of the new system, as well as a discussion of the new algorithm behind the system, was presented to the Information Systems Committee at the 1998 Fall Conference of the Commercial Vehicle Safety Alliance. Comments regarding the system were quite positive.

The ISS-2 was completed and distributed for testing beginning January 1999. The final version was presented to the Information Systems and the Intelligent Transportation Systems Committees at the 1999 Spring Workshop of the Commercial Vehicle Safety Alliance. Once again, positive comments were received regarding the system. Other comments obtained through interviews of participating states by the author have been overwhelmingly positive as well. Specifically, one inspector from the state of New York commented in a written response that he "found ISS-2 better in all aspects–format, description, details, ability to print report, and most of all, accuracy."

Because there was some concern with having two versions of the ISS in use at the roadside at one time, a comparison analysis of the original ISS and the ISS-2 was completed by the author in May 1999. This analysis revealed that for carriers recommended for inspection in ISS-2 (using SafeStat), less than 4 percent were not recommended for inspection in the original ISS. Once again, this demonstrates the high correlation between SafeStat and the original ISS algorithm.

In June 1999, data were obtained to assess the system and to make additional comparisons between the original ISS and the ISS-2. The method and results of this analysis are described below.

DATA ANALYSIS AND RESULTS

One of the main commercial vehicle safety activities of FMCSA is to conduct roadside inspections. Roadside inspections follow a standard known as the North American Standard, which was developed by the Commercial Vehicle Safety Alliance in cooperation with the Federal Highway Administration. Inspections involve an examination of vehicles, drivers, and hazardous material cargo; and focus on critical safety regulations. They include provisions for placing vehicles and/or drivers out-of-service (OOS) if unsafe conditions are discovered. These problems must be corrected prior to the continuation of a trip (*3*).

Data obtained from roadside inspections of motor carriers are input, or uploaded from a computer, locally by the states into an information system termed SafetyNet. The states then transmit relevant data for carriers electronically to the Motor Carrier Management Information System (MCMIS) at FMCSA Headquarters.

Inspection data from states involved with the testing of ISS-2 were requested from the MCMIS for January through June 1999. For each inspection, the data contained the inspection date; the Department of Transportation census number of the carrier inspected; the inspection report number; the level of inspection; and an indication if the driver, vehicle, or both were put out-of-service (OOS). Using the census number, this data set was merged with data sets containing the carrier's original ISS value and their ISS-2 value.

The data contained information regarding 213,585 roadside inspections conducted in the seven states during the six-month period. Examining these inspections, the driver OOS rate was 6.7 percent, the vehicle OOS rate was 24.3 percent, and the total OOS rate was 25.1 percent. Table 1 represents the OOS rates by the original ISS and ISS-2 recommendations overall. Table 2 illustrates the OOS rates by the original ISS and ISS-2 recommendations for inspections of

carriers with sufficient safety data (i.e., enough safety data to receive at least one SEA value and thus a score from the safety algorithm of ISS-2). Table 3 displays the OOS rates by the original ISS and ISS-2 recommendations for those inspections of carriers with insufficient safety data, i.e., those which receive a score from the insufficient data algorithm of ISS-2.

An examination of the tables shows that both algorithms are similar in their ability to predict which inspections will result in an OOS driver and/or vehicle. Table 1 is perhaps the best to make direct comparisons with because, as described previously, the original ISS algorithm combines safety and insufficient data components into one algorithm, while ISS-2 keeps them separate. Examining the difference in the total OOS rate between inspections with a pass recommendation and those with an inspect recommendation reveals that there is more than a 60 percent increase in the number of vehicles and drivers placed OOS when there is an inspect recommendation.

Table 1 also illustrates that the original ISS may be slightly better than ISS-2 at predicting those that will be OOS. There is a total OOS rate of 32.5 percent for those recommended for inspection in the original ISS versus a total OOS rate of 30.4 percent for those recommended for inspection in ISS-2. However, ISS-2 is slightly better at predicting ones that will *not* be put OOS. There is a total OOS rate of 19.8 percent for those not recommended for inspection in the original ISS versus a total OOS rate of 18.3 percent for those not recommended for inspection in ISS-2.

One also may notice that the total number of inspections recommended for inspection in ISS-2 is more than twice as many as those recommended for inspection in the original ISS. However, comparing the OOS rates for inspections in the optional range, it appears that those labeled as optional in the original ISS have almost as high OOS rates as those recommended for

inspection. Thus, it may be advisable to place those currently labeled as optional in the original ISS into the inspect category.

Table 2 illustrates the same information as Table 1 only for inspections of carriers who had sufficient safety data in ISS-2 as defined previously. It is interesting to note that 86 percent of the carriers stopped for inspection in the states in this time frame had sufficient safety data.

Table 3 illustrates the same information as above only for inspections on carriers who did *not* have sufficient safety data as defined previously. The main point to notice here is how high the OOS rates are for carriers with insufficient data. This definitely lends credence to the notion that these carriers should continue to be targeted for inspection, in addition to the ones with known poor safety performance.

Table 1. OOS Rates by the Original ISS and ISS-2 Recommendations Overall (n=213,585 inspections)

	Original ISS Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	118,029	57,067	38,489
Driver OOS Rate	5.5%	7.3%	9.2%
Vehicle OOS Rate	18.9%	30.4%	31.3%
Total OOS Rate	19.8%	30.8%	32.5%
	ISS-2 Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	72,988	44,638	95,959
Driver OOS Rate	3.8%	6.5%	8.9%
Vehicle OOS Rate	18.3%	24.3%	29.0%
Total OOS Rate	18.3%	24.7%	30.4%

Table 2. OOS Rates by the Original ISS and ISS-2 Recommendations for Inspections of Carriers with Sufficient Safety Data (n=183,239 inspections)

	Original ISS Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	112,070	45,791	25,378
Driver OOS Rate	5.4%	6.9%	9.1%
Vehicle OOS Rate	18.7%	30.9%	32.1%
Total OOS Rate	19.6%	31.1%	33.0%
	ISS-2 Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	72,988	39,077	71,174
Driver OOS Rate	3.8%	6.3%	8.9%
Vehicle OOS Rate	18.3%	24.2%	29.1%
Total OOS Rate	18.3%	24.5%	30.4%

Table 3. OOS Rates by the Original ISS and ISS-2 Recommendations for Inspections of Carriers with Insufficient Safety Data (n=30,346 inspections)

	Original ISS Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	5,959	11,276	13,111
Driver OOS Rate	6.8%	9.0%	9.4%
Vehicle OOS Rate	22.2%	28.6%	29.7%
Total OOS Rate	23.9%	29.8%	31.7%
	ISS-2 Recommendation		
	Pass	**Optional**	**Inspect**
Number of inspections	0	5,561	24,785
Driver OOS Rate	N/A	7.6%	9.0%
Vehicle OOS Rate	N/A	24.9%	28.5%
Total OOS Rate	N/A	26.0%	30.3%

CONCLUSION

This paper discussed the SafeStat and ISS algorithms, and their integration into a resulting system termed ISS-2. In addition, results were presented from initial testing of the ISS-2. As indicated in the previous analysis, ISS-2 is just as effective as the original ISS in meeting the goals it was designed for. It successfully identifies and prioritizes for roadside inspection vehicles and drivers of carriers with poor prior safety performance, and those with few or no previous inspections. The analysis indicates that 60 percent more vehicles and drivers are put out-of-service when ISS-2 recommends the inspection versus when it does not. The analysis also gives support to the idea that carriers with insufficient safety data should continue to be targeted for inspection as they have higher out-of-service rates than those not recommended for inspection. In addition, based on comments and interviews with the participating states, safety inspectors testing the system are very pleased with the new algorithm and the new features present in ISS-2.

Because of its effectiveness and popularity, and its ability to unify all of FMCSA's safety programs with a common rating of motor carriers, the obvious conclusion is that ISS-2 should be fully implemented and the original ISS should be phased out. This is expected to occur over the next year.

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APPENDIX 1:

A DETAILED DESCRIPTION OF THE ISS-2 SAFETY AND INSUFFICIENT DATA ALGORITHMS

The ISS-2 Algorithm

The **Safety Algorithm** for ISS-2 is calculated as follows:

(1) Place carriers in categories and groups based on their score in each Safety Evaluation Area (SEA) similar to those used by SafeStat (see Table 4). Note that the groups use the carrier's *applicable highest* SEA values.

(2) Within each group 1 through 11 and 16 through 26, sum the carrier's SEA indicators placing 2 times as much weight on the Accident SEA and 1.5 times as much weight on the Driver SEA if applicable.

(3) For groups 12, 13, 14, 15, 27, 28, 29, 30, 42, 43, 44, and 45, the "sum" is simply the SEA value (the only one applicable).

(4) For groups 31 through 41, use the *maximum* of the Accident, Driver, Vehicle, and/or Safety Management SEA (for example, if a carrier received a Driver SEA of 49, a Vehicle SEA of 35, and an Accident SEA of 20, use the value 49 as the "sum").

(5) Then starting with category A, rank all carriers based on their sum, then go to category B continuing the ranking, ... down through category F.

Note that these rankings (for categories A through F) are then assigned percentile ranks from 75 to 100.

(6) The remaining G and H categories are combined and ranked all together. However, category G (group 15) carriers should be ranked higher than all category H carriers.

Note that these rankings (for categories G and H) are then assigned percentile ranks from 1 to 74.

These percentile ranks (for all categories) then become the Safety ISS-2 inspection value.

Table 4. Safety ISS-2 Groups

Category	Group	SEA Values
A	1	Acc>=75, Drv>=75, Veh>=75, Saf>=75
	2	Acc>=75, Drv>=75, Veh>=75
	3	Acc>=75, Drv>=75, Saf>=75
	4	Acc>=75, Veh>=75, Saf>=75
B	5	Drv>=75, Veh>=75, Saf>=75
	6	Acc>=75, Drv>=75
	7	Acc>=75, Veh>=75
	8	Acc>=75, Saf>=75
C	9	Drv>=75, Veh>=75
	10	Drv>=75, Saf>=75
	11	Veh>=75, Saf>=75
D	12	Acc>=75
E	13	Drv>=75
F	14	Veh>=75
G	15	Saf>=75

(continued)

Table 4. Safety ISS-2 Groups (continued)

Category	Group	SEA Values
H	16	50<=Acc<75, 50<=Drv<75, 50<=Veh<75, 50<=Saf<75
	17	50<=Acc<75, 50<=Drv<75, 50<=Veh<75
	18	50<=Acc<75, 50<=Drv<75, 50<=Saf<75
	19	50<=Acc<75, 50<=Veh<75, 50<=Saf<75
	20	50<=Drv<75, 50<=Veh<75, 50<=Saf<75
	21	50<=Acc<75, 50<=Drv<75
	22	50<=Acc<75, 50<=Veh<75
	23	50<=Acc<75, 50<=Saf<75
	24	50<=Drv<75, 50<=Veh<75
	25	50<=Drv<75, 50<=Saf<75
	26	50<=Veh<75, 50<=Saf<75
	27	50<=Acc<75
	28	50<=Drv<75
	29	50<=Veh<75
	30	50<=Saf<75
	31	0<Acc<50, 0<Drv<50, 0<Veh<50, 0<Saf<50
	32	0<Acc<50, 0<Drv<50, 0<Veh<50
	33	0<Acc<50, 0<Drv<50, 0<Saf<50
	34	0<Acc<50, 0<Veh<50, 0<Saf<50
	35	0<Drv<50, 0<Veh<50, 0<Saf<50
	36	0<Acc<50, 0<Drv<50
	37	0<Acc<50, 0<Veh<50
	38	0<Acc<50, 0<Saf<50
	39	0<Drv<50, 0<Veh<50
	40	0<Drv<50, 0<Saf<50
	41	0<Veh<50, 0<Saf<50
	42	0<Acc<50
	43	0<Drv<50
	44	0<Veh<50
	45	0<Saf<50
I	46	No SEA value in any SEA

The **Insufficient Data** Algorithm for ISS-2 is calculated as follows:

Only if a carrier does not receive a score from the Safety Algorithm (Category I, Group 46) (everything is based on the past 30 months):

Case 1: *If a carrier has zero (0) roadside inspections (Level I, II, III, or V),* assign an ISS-2 value based only on their size as follows:

Category				**ISS-2 Value**
1001+ power units	OR	1001+ drivers	=	100
201-1000 power units	OR	201-1000 drivers	=	99
64-200 power units	OR	72-200 drivers	=	98
16-63 power units	OR	16-71 drivers	=	97
7-15 power units	OR	6-15 drivers	=	96
2-6 power units	OR	2-5 drivers	=	95
1 power unit	OR	1 driver	=	94

(1) Assign the carrier the *higher* of their values. For example, if a carrier has 75 power units (ISS-2 value=98) and 50 drivers (ISS-2 value=97), they would receive a final ISS-2 value of 98.

(2) *If there is no power unit information nor driver information*, simply assign them the midpoint ISS-2 value of 97.

Case 2: *For carriers with one or more previous roadside inspections,* determine their Inspection per Power Unit Rate, their Inspection per Driver Rate, and subsequent Inspection Average Rate as follows and rank from 50-100.

(1) The Inspection per Power Unit Rate is determined by dividing the number of Level I, II and V inspections the carrier has had in the previous 30 months by the number of power units they indicate.

(2) Similarly, the Inspection per Driver Rate is determined by dividing the number of Level I, II, and III inspections the carrier has had in the previous 30 months by the number of drivers they indicate.

(3) The **Inspection Average Rate** is then the average of these two rates (the Inspection per Power Unit Rate and the Inspection per Driver Rate). *If one of the rates is unable to be determined (because of no power unit or driver information), the Inspection Average Rate is simply the rate which can be determined.*

(4) Using these Inspection Average Rates, assign a ranking of 50 to 100 to the carriers (the *lowest* Inspection Average Rates should get the highest rankings), which then becomes these carriers' ISS-2 values.

If there is no size information available to calculate the Inspection Average Rate (but, the carrier does have at least one inspection), the ISS-2 value is simply the arbitrary value, 92.

Thus, ALL carriers in MCMIS should have a Safety ISS-2 value OR an Insufficient Data ISS-2 value.

APPENDIX 2:

A “LOOK” AT ISS-2

ISS-2

ISS-2 The Inspection Selection System *January, 2000*

The ISS is a decision-aid which provides an easy means of selecting vehicles for roadside inspection based on SafeStat and the carrier's history of past inspections.

HISTORY – The ISS has been very successful since introduced in 1995. The concept was originally mandated by Congress as a means of using prior safety data to guide carrier selection for inspections and prevent: "over and under sampling" of motor carriers. The original ISS algorithm was developed by North Dakota State University, the OMC Field Systems Group, and a Technical Working Group of State officials. It proved to be a good predictor of carrier safety status and met the expectations of roadside State inspectors. This latest version of ISS is based on SafeStat, the National carrier ranking system, and hence unifies all carrier ranking under a single process. ISS-2 also adds various requested features to improve the usefulness at the roadside.

New Features in ISS-2:

– Calculation of inspection value (IV) based on SafeStat score.
– Carriers without SafeStat scores also receive IV.
– Intrastate carriers can also receive IV.
– Incremental carrier name search based on legal name.
– Displays carrier dba (doing business as) name (if in MCMIS).
– Displays carrier terminal addresses (if they are in MCMIS)
– Displays SAFESTAT SEA indicator values.
– Displays PRISM status if carrier is sanctioned.
– Insurance status is displayed for common & contract carriers.
– Mexican Carrier Commercial Zone authority is displayed.
– Can do name lookup on intrastate carriers if State maintains data.
– Has new Windows 2000 look & feel.
– All existing features of ISS are supported.

A LOOK AT THE NEW ISS SCREENS – The new ISS-2 screens, are similar to the original ISS in that they use the tabbed notebook concept**.** However, all critical decisions can be made from information displayed on the top "MAIN" page so the user doesn't really have to navigate the other pages.

Figure 1. Main Screen

To find a carrier, enter the DOT#, ICC#, or use the "Search by Carrier Name" button. Once a match is made, the inspection value is displayed with the recommendation: INSPECT, OPTIONAL, or PASS. In addition, a flashing stop light icon is displayed with red, yellow, and green lights. Also, the "expert" window provides textual comments based on analysis of the data. The bottom of the screen indicates the basis of the displayed Inspection Value. Sources include:

1. Inspection value is based on SAFESTAT data.
2. Inspection value is based on lack of safety performance data.
3. Inspection value is based on MCSIP (part of PRISM).

Figure 2. HM Icon

HM ALERT – Another new feature is the HM circle icon which displays when the carrier has previously been inspected while hauling hazardous materials. The Expert box also provides a text description of the percent of inspections which involved Hazardous Materials loads.

DBA NAMES – ISS2 will provide a list of "doing business as" or dba names which the carrier may be using. To see the dba names, press the DBA Names button on the main screen. If there are no dba names (which applies to about 65% of the carriers), this button will be grayed out. Note that dba names are not used in ASPEN nor SAFETYNET to identify the carrier. These systems use the company's legal name for identification. ISS, when used with ASPEN, will transfer the carrier's legal name into ASPEN data fields.

SEARCHING BY CARRIER NAME – Long requested, this feature is incorporated into ISS-2 as a means of locating a carrier when the DOT or ICC number is unknown. The search is "incremental" meaning that as you type the word, the system will jump to that point in the data table. Incremental searching lets you easily search the carrier list. However, name searching has the potential for assigning the wrong carrier. Consider:

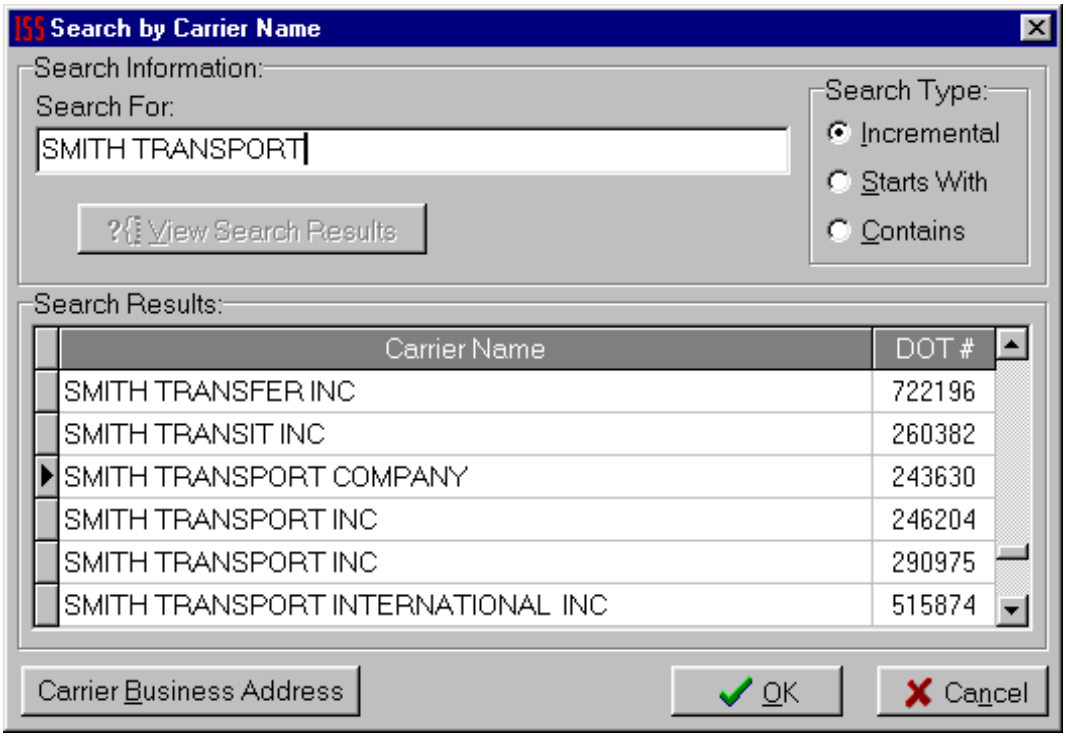

Figure 3. Name Search

In this case, it is not clear which Smith Transport is the real carrier. Using the highlighter to select an entry and pressing the Carrier Business Address button, you can see the principal address for the various companies. Note that searches can be made with:

Incremental	– Each letter typed refines the match	FAST
Starts with	– When you know how the name starts	SLOW
Contains	– When the name is unclear, but contains a word	VERY SLOW

As a check against ambiguous searches, the system will display a warning dialog box if there are hundreds of matches. The box asks if you want to display all or reenter your search words. It is important to remember that you are searching a database of about 500,000 carriers. Use the best name possible when starting the search.

INTRASTATE CARRIERS – Within ISS-2 there is a complete data access system to allow access to State maintained intrastate carrier data in a similar fashion as is done for interstate carriers. Most features of ISS are available for intrastate carriers providing the State Agency maintains the underlying databases.

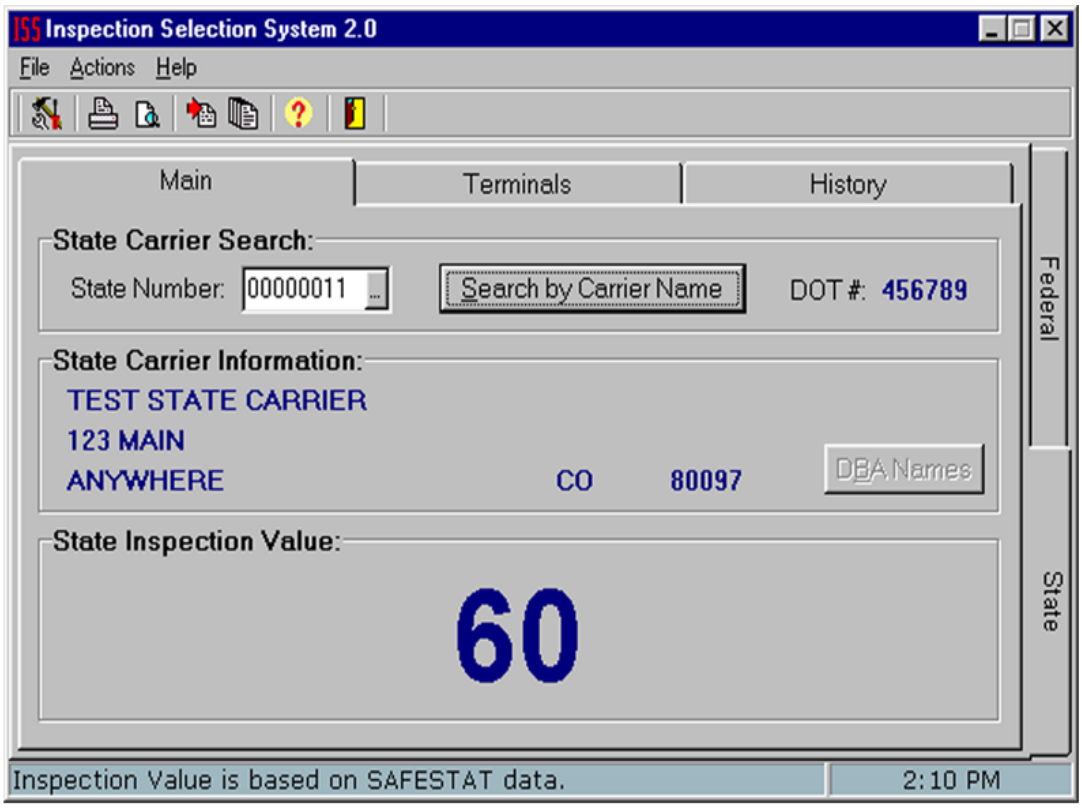

Figure 4. Intrastate carrier Access

DETAILS – The details screen contains certain basic carrier statistics including:

- SafeStat SEA indicator scores
- SafeStat category codes & updates
- Carrier fleet size data
- Out of service rates
- Number of past Inspections
- Last Safety Fitness Rating

In addition this screen contains buttons which allow access to carrier insurance status data, and terminal addresses. If no such data exists for that carrier the buttons will be grayed out.

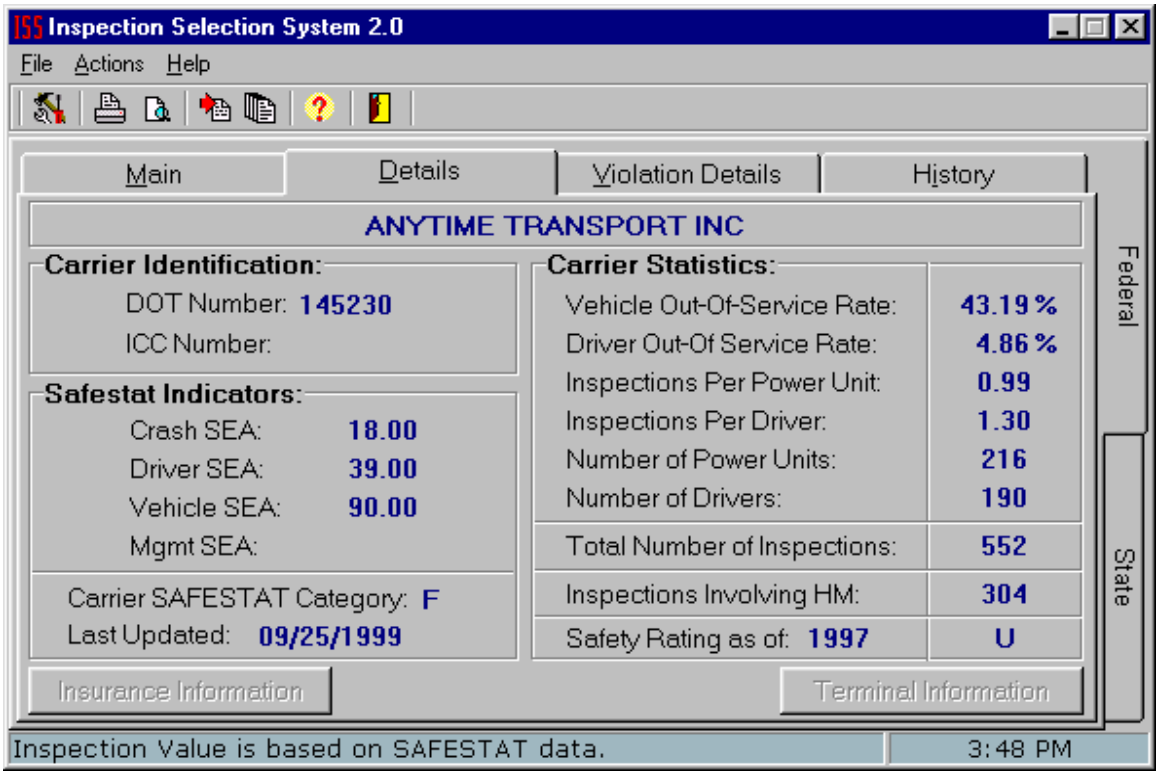

Figure 5. Details Screen

INSURANCE INFORMATION IN ISS-2 – Insurance status information on common and contract carriers is on a pop-up screen. Insurance details are limited to information critical to roadside inspections. Much more detailed insurance information is available on the SAFER web site at www.safersys.org. Note also that carriers requiring insurance must carry documents showing proof of insurance on all vehicles.

The insurance status information comes from OMC's Insurance & Licensing System (http://fhwa-li.volpe.dot.gov) for intranet users. Data in that system is updated daily from carriers and insurance companies. SAFER is refreshed weekly and this data is included in the weekly ISS snapshot refresh.

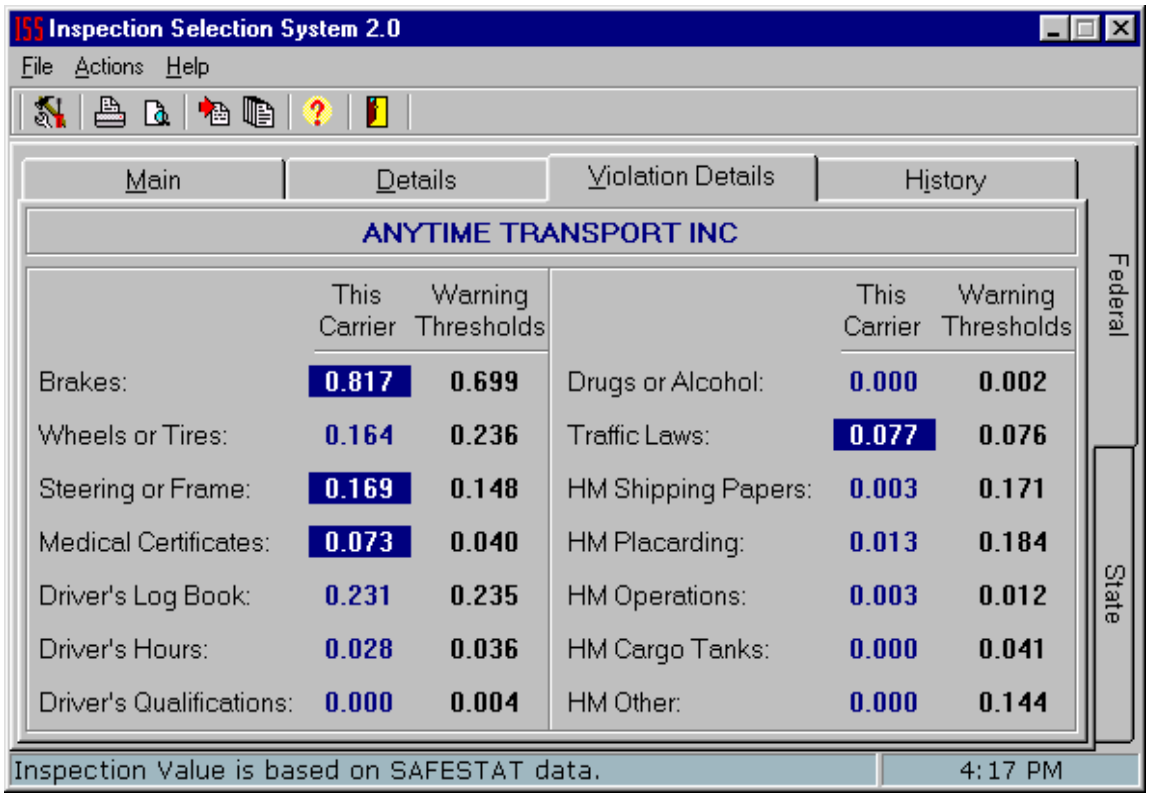

Figure 6. Violations Details Screen

VIOLATION DETAILS – This tab section compares the status of violation categories for the selected carrier against the National average for similar carriers. Categories in which the selected carrier exceeds the National mean are highlighted. The idea is to point out areas where the carrier has a history of violations beyond the normal.

HISTORY LOG – The History log, (no screen shot included) contains a simple grid showing all carrier lookups done by ISS. Included is the carrier name, IV, data/time of the lookup, and DOT/ICC #. There is also space for the user to enter comments on any of the lookups. The comments are kept local to the system. The history log and comment section are most useful to port of entry screening applications.

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