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TANK BARGE DAMAGE PROFILE ANALYSIS.

R. D. LEIS

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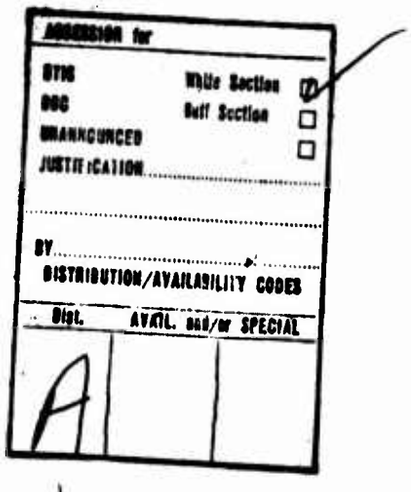

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16. Abstract

This report describes the analysis of tank barge damage as reported in special survey reports from Coast Guard field inspectors. The damages were analyzed in terms of general type, frequency of occurrence in various areas of the barge and general size to develop a profile for identifying temporary repair application and operational environment for the establishment of suitable evaluation test procedures.

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TANK BARGE DAMAGE PROFILE ANALYSIS

by

R. D. Leis

1.0 INTRODUCTION

This report presents the results of one portion of the program entitled "Tank Barge Damage Survey/Temporary Repair Study" (Contract No. DOT-CG-23223-A, Task 16) conducted by Battelle's Columbus Laboratories for the U. S. Coast Guard. This program is the second phase of a three-phase program to develop the information necessary to evaluate temporary repairs to tank barges. Phase I, conducted by the National Maritime Research Center, Galveston, Texas, consisted of a "state-of-the-art" study of tank barge temporary repairs. Phase II had three objectives.

(1) To analyze the effectiveness of double barriers in preventing cargo tank penetration in tank barges.

(2) To analyze and define the profile of damages which occur to tank barges.

(3) To develop suitable test procedures for the compilation of performance parameters of temporary repair materials which are pertinent to the assessment of their adequacy in use. These will be recommended for execution in Phase III of the overall tank barge temporary repair program.

This report presents the results of Item (2) above--the analysis of tank barge damage profiles.

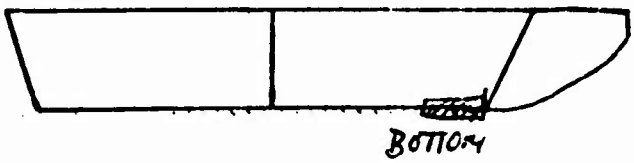
2.0 SOURCE MATERIAL

The source material upon which this analysis is based is a compilation of over 700 special damage survey reports submitted to Coast Guard Headquarters by field inspection units (see Exhibit 1). The damages reported were those observed during approximately one year on scheduled inspections and special examinations; as, for example, would follow a casualty or major repair activity.

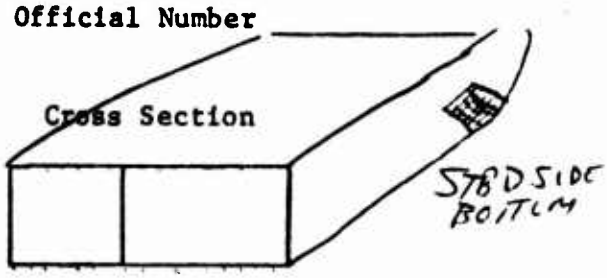
EXHIBIT 1. SAMPLE DAMAGE SURVEY SHEET

Vessel Name _____ Official Number _____

1. Profile Section



Cross Section



(Indicate damage on above sketches)

2. Type of damage (holed, fractured, wasted, etc.) UPSET

3. Location of center of damage

   a. Longitudinally from nearest end of barge 35'

   b. Vertically from bottom 0'

   c. Longitudinal extent of damage 17'

   d. Vertical extent of damage 0'

   e. Transverse extent of damage 8'

4. Single or double sided DOUBLE

   a. Was side cargo containment boundary penetrated? No

   b. Would the construction of 24" double sides have prevented the side cargo containment boundary from being penetrated? N/A

5. Single or double bottom DOUBLE

   a. Was bottom cargo containment boundary penetrated: No

   b. Would the construction of 24" double bottoms have prevented the bottom cargo containment boundary from being penetrated? N/A

6. The last cargo carried in the tank affected/Did tank carry cargo at time of damage (if info is readily available)? N/A

7. Probable cause of damage GROUNDING

8. Cost of permanent repairs/weight of replacing materials *2000 / 3900#

The information contained in these survey forms was analyzed and each separate damage incident was coded onto data sheets. An example of the data sheet and coding instructions is given in Appendix A. These data were then merged with the Vessel File (maintained in G/MIS) for all barges in which damages were reported. This was necessary to obtain a complete data base which included physical barge descriptors--such as key dimensions--which were necessary for the immediate analysis purposes or may be necessary for future analyses. Appendix B contains the data record layout which resulted. The data base submitted to G/MIS is in accordance with this layout. A total of 1,289 separate damage incidents survived this process--after normal attrition due to incomplete survey forms or the lack of a vessel "match" with the Vessel File.

These data were loaded onto the INFONET* system for analysis using the SALTS (Safety Analysis Logic Tree System) developed for the Coast Guard by Battelle. SALTS is an on-line interactive computerized system designed to facilitate the analysis of data. The system provides the analyst with the means to create an analytical tool, based on fault-tree logic and data-base sort criteria, for characterizing the contents of the data. This tool is created by the user in the form of a "tree" whose structure is based on nodes connected by logic gates.

By comparing the data elements of Appendix A with those supplied in Exhibit 1, it will be noted that considerably more information was coded than was specifically submitted on the survey forms. These added elements were desirable for a more complete analysis capability. They were, in most cases, deduced from the totality of information provided on the survey reports. For example, end-void information was not supplied. However, if the barge sustained a hole in the end with no tank penetration, the existence of an end void can be assumed with reasonable certainty.

Other desired data elements, however, were not supplied and could not be deduced with certainty. For example, the transverse location of damage was not requested. A rake end on a barge caused problems in locating

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* SALTS was implemented on Computer Science Corporation's INFONET System. INFONET is an acronym coined by CSC to denote information network.

end damage. Many times key questions were not answered. These data deficiencies, when combined with similar data deficiencies for some vessels in the Vessel File (such as the lack of key dimensions), resulted in something less than a comprehensive and accurate data base. The project staff attempted to compensate for some of these deficiencies--again by inference. The net result is a data base which is compromised to some degree.

This discussion is not given to dilute the reader's confidence in the following analysis results. However, he is cautioned to observe the trends discussed and not to dwell on the accuracy of any specific number. In general, these inaccuracies will be on the order of 1 to 2 percent with the exception of analyses which compound inferences. In these latter cases, special notice will be given.

3.0 CONCLUSIONS

The analyses performed in this task were aimed at (1) generating tank barge damage information pertinent to the understanding of tank barge damages and (2) developing damage parameters pertinent to the establishment of test procedures for temporary repairs. As such, there are no specific conclusions. Rather, the findings are embodied in the analyses performed as discussed in the following section.

4.0 PROGRAM ANALYSES

The general approach used in selecting the analyses to be performed in this task was to analyze the barge damage data in general form and move toward the specific forms. Appendix D, a compilation of SALTS results*, is arranged in this manner. Exhibits D-1 through D-8 examine the incidence of all damage, hull ruptures, cracks, and holes with respect to the bow and stern for various areas of the barge. Exhibits D-9 through D-12 examine side damage in a longitudinal and vertical location matrix for hull ruptures, cracks, holes, and wasted through damage types, respectively. Exhibit D-13

* The event pool used for these analyses is given in Appendix C.

examines the crack lengths sustained; Exhibit D-14 examines the area of holes sustained; and Exhibit D-15 examines the areas of wasted through damage sustained.

In general, all analyses reference a specific area of a barge--such as side plane. These areas are defined in Exhibit 2. In this exhibit, the "codes" given in parenthesis correspond to the names used in the exhibits in Appendix D. For example, PAS means Plane Area Side. In the discussions which follow, these codes will not be used. They are introduced here only for the reader who understands SALTS and wishes to examine Appendix D for his own analytical purposes.

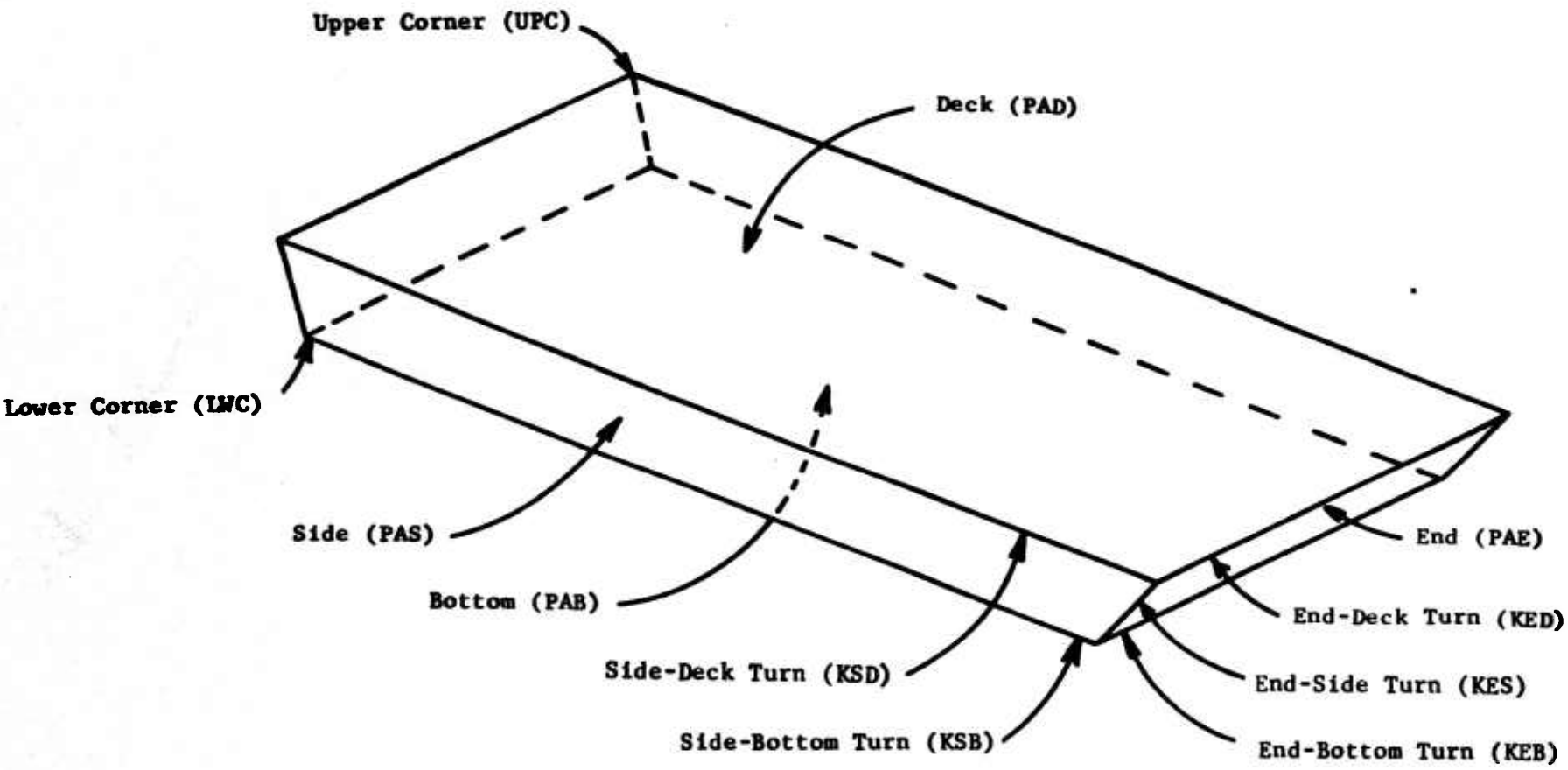
4.1 BARGE DAMAGE FREQUENCY BY TYPE AND LOCATION

The first set of analyses was aimed at defining the basic types of damage and their occurrence with relation to various areas of the barge (Exhibits D-1 through D-8). Exhibit 3 summarizes these results. In this exhibit, the number of incidents of reported damage and subsequent hull rupture to each major barge area is given. In addition, the hull-rupture incidents are further subdivided into basic types: cracks and fractures, holes, and wasted-through areas. Each of these damage types was further analyzed to determine their frequency of occurrence in percentage intervals of the barge side profile.

Exhibits 4 and 5 were constructed from Exhibit 3. These exhibits show, in graphic form, the relative frequency of damage and hull rupture which occur in major barge areas. They reflect the dominance of damage to planes--in terms of both reported incidents and hull ruptures. The knuckles, or intersections of basic planes, however, sustain sufficient damage for concern in identifying the application environment for temporary repairs.

Exhibit 6 shows the distribution of damage incidents and their components with relation to the side profile of the barge. For example, approximately 30 percent of all damages are incurred within the first 10 percent of the barge. This is composed of the following:

EXHIBIT 2. TANK BARGE DAMAGE AREAS--DEFINITIONS USED IN SALTS ANALYSES



DAMAGE AREA DEFINITIONS

EXHIBIT 3. TANK BARGE DAMAGE PROFILE--SUMMARY LOCATIONS BY TYPE OF DAMAGE AND BARGE AREA DAMAGED
Number of Incidents with Centerline Location in Specified Interval--Intervals are Percent of Barge Length Referenced from Bow

Type of Damage	Barge Area Damaged	Total Number of Incidents	Percent 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
All incidents	All	1289	351	148	104	87	95	48	44	46	62	170
Hull ruptures	Ditto	724	225	84	59	42	47	25	26	28	36	113
Cracks/fractures	"	419	119	51	34	22	28	17	14	16	18	74
Holes	"	331	117	39	27	22	17	10	14	10	19	41
Wasted through	"	21	5	--	2	2	5	1	1	2	--	2
All incidents	Side plane	338	78	44	35	28	29	17	11	16	22	32
Hull ruptures	Ditto	226	57	28	28	13	16	10	9	10	17	24
Cracks/fractures	"	152	35	20	15	9	10	9	6	7	9	19
Holes	"	83	24	8	13	6	4	3	5	3	9	6
Wasted through	"	4	2	--	--	--	2	--	--	--	--	--
All incidents	Bottom plane	246	17	47	33	36	29	15	17	12	15	12
Hull ruptures	Ditto	128	11	27	15	19	13	7	10	7	7	7
Cracks/fractures	"	54	4	13	8	6	8	1	5	4	3	1
Holes	"	71	7	15	6	14	4	5	4	2	4	6
Wasted through	"	9	1	--	2	1	2	1	1	1	--	--
All incidents	Deck plane	47	10	5	6	3	3	--	1	4	5	5
Hull ruptures	Ditto	25	5	2	1	1	3	--	1	3	2	3
Cracks/fractures	"	16	2	1	1	--	2	--	--	2	2	3
Holes	"	11	3	2	--	1	1	--	1	1	1	--
Wasted through	"	--	--	--	--	--	--	--	--	--	--	--
All incidents	End plane	134	86	7	--	--	--	--	--	--	--	41
Hull ruptures	Ditto	86	56	1	--	--	--	--	--	--	--	29
Cracks/fractures	"	47	30	1	--	--	--	--	--	--	--	16
Holes	"	42	30	--	--	--	--	--	--	--	--	12
Wasted through	"	2	--	--	--	--	--	--	--	--	--	2
All incidents	Turn-side/bottom	141	12	24	15	10	23	9	10	8	11	10
Hull ruptures	Ditto	93	8	12	11	2	9	4	4	5	5	4
Cracks/fractures	"	45	3	7	7	1	5	3	2	3	2	3
Holes	"	37	5	6	6	1	6	2	2	2	2	2
Wasted through	"	1	--	--	--	--	--	--	--	--	--	--
All incidents	Turn-side/deck	80	15	5	12	10	8	5	3	4	5	5
Hull ruptures	Ditto	43	7	4	4	7	4	3	1	1	4	2
Cracks/fractures	"	30	5	4	3	6	3	3	--	--	1	1
Holes	"	13	2	1	2	--	1	--	1	--	3	1
Wasted through	"	2	--	--	--	1	--	--	--	1	--	--
All incidents	Turn-end/side	78	43	2	1	--	--	--	--	--	--	32
Hull ruptures	Ditto	48	23	--	--	--	--	--	--	--	--	25
Cracks/fractures	"	31	13	--	--	--	--	--	--	--	--	18
Holes	"	18	11	--	--	--	--	--	--	--	--	7
Wasted through	"	--	--	--	--	--	--	--	--	--	--	--
All incidents	Turn-end/deck	39	28	--	--	--	--	--	--	--	--	11
Hull ruptures	Ditto	33	24	--	--	--	--	--	--	--	--	9
Cracks/fractures	"	20	14	--	--	--	--	--	--	--	--	6
Holes	"	15	12	--	--	--	--	--	--	--	--	3
Wasted through	"	--	--	--	--	--	--	--	--	--	--	--
All incidents	Turn-end/bottom	49	31	8	2	--	--	--	--	--	1	6
Hull ruptures	Ditto	21	16	5	--	--	--	--	--	--	--	--
Cracks/fractures	"	7	5	2	--	--	--	--	--	--	--	--
Holes	"	18	14	4	--	--	--	--	--	--	--	--
Wasted through	"	1	1	--	--	--	--	--	--	--	--	--
All incidents	Upper corner	18	7	--	--	--	--	--	--	--	--	11
Hull ruptures	Ditto	10	4	--	--	--	--	--	--	--	--	6
Cracks/fractures	"	9	3	--	--	--	--	--	--	--	--	6
Holes	"	2	1	--	--	--	--	--	--	--	--	1
Wasted through	"	--	--	--	--	--	--	--	--	--	--	--
All incidents	Lower corner	37	23	5	--	--	--	--	--	--	--	7
Hull ruptures	Ditto	21	13	4	--	--	--	--	--	--	--	4
Cracks/fractures	"	7	4	2	--	--	--	--	--	--	--	1
Holes	"	13	8	2	--	--	--	--	--	--	--	3
Wasted through	"	1	1	--	--	--	--	--	--	--	--	--
All incidents	Massive area	12	1	1	--	--	3	2	1	2	1	--
Hull ruptures	Ditto	9	1	1	--	--	2	1	1	2	1	--
Cracks/fractures	"	5	1	1	--	--	--	1	1	--	1	--
Holes	"	5	--	1	--	--	1	--	1	2	--	--
Wasted through	"	1	--	--	--	--	1	--	--	--	--	--

EXHIBIT 4. FREQUENCY OF DAMAGE IN MAJOR BARGE AREAS

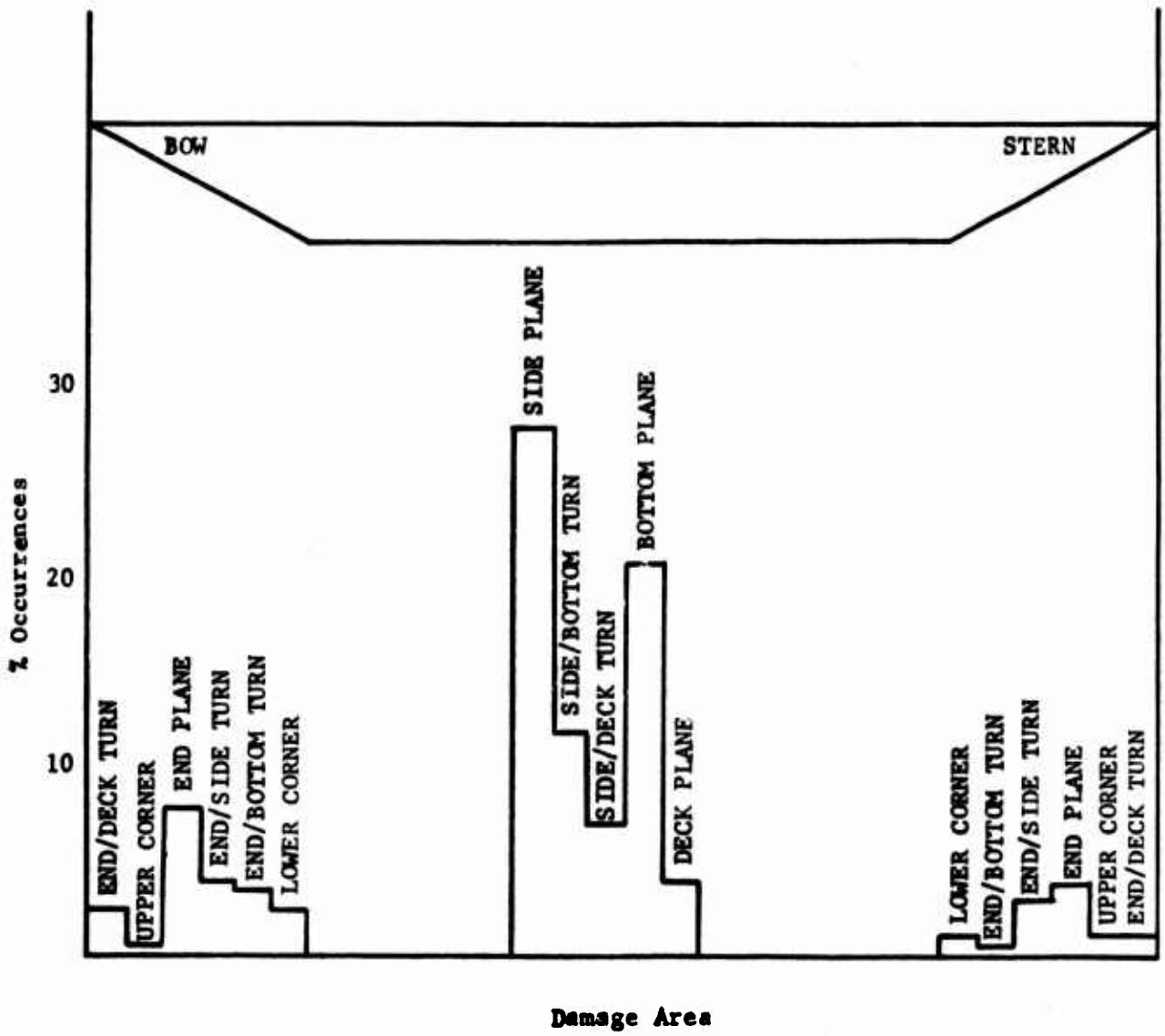
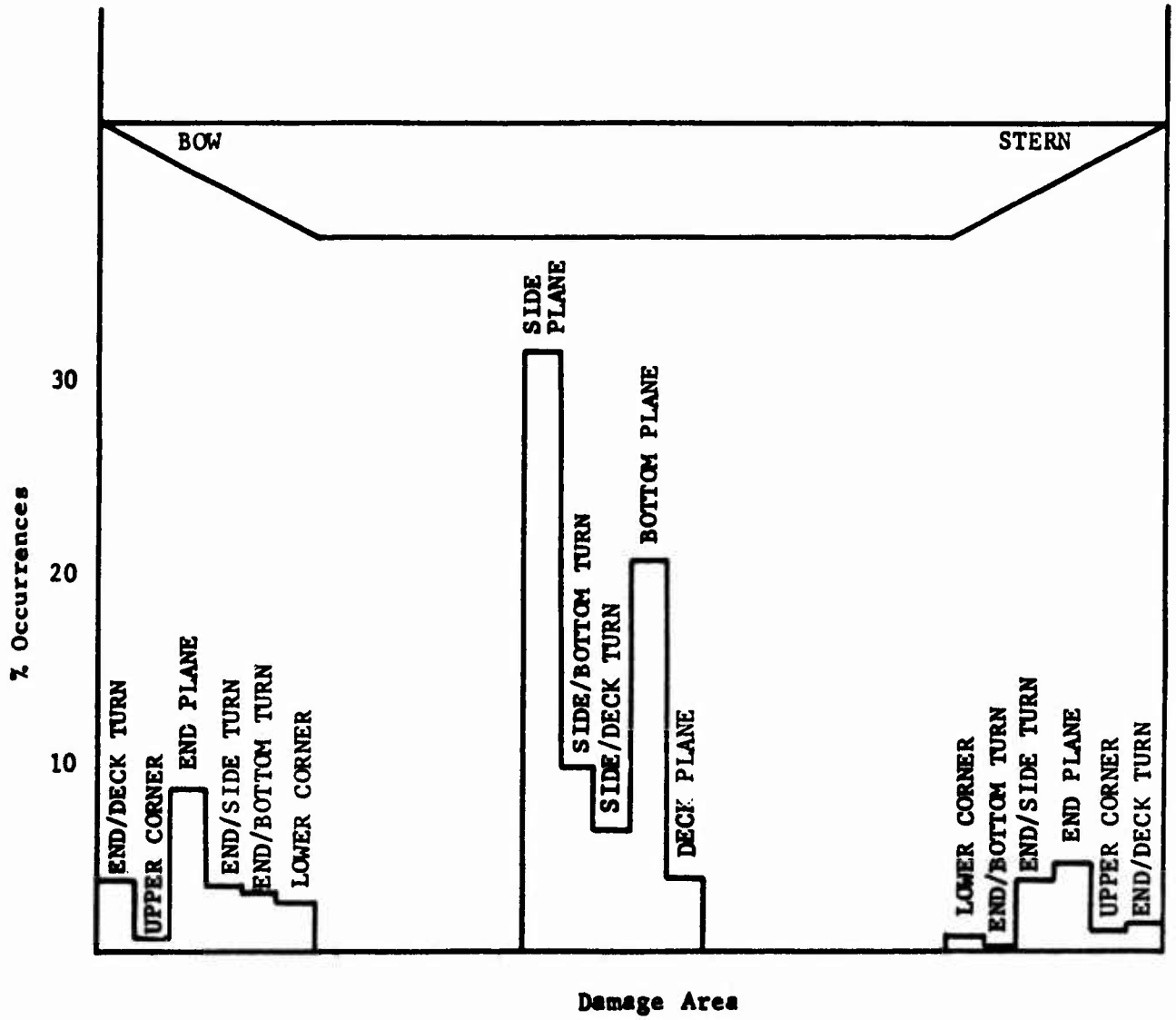
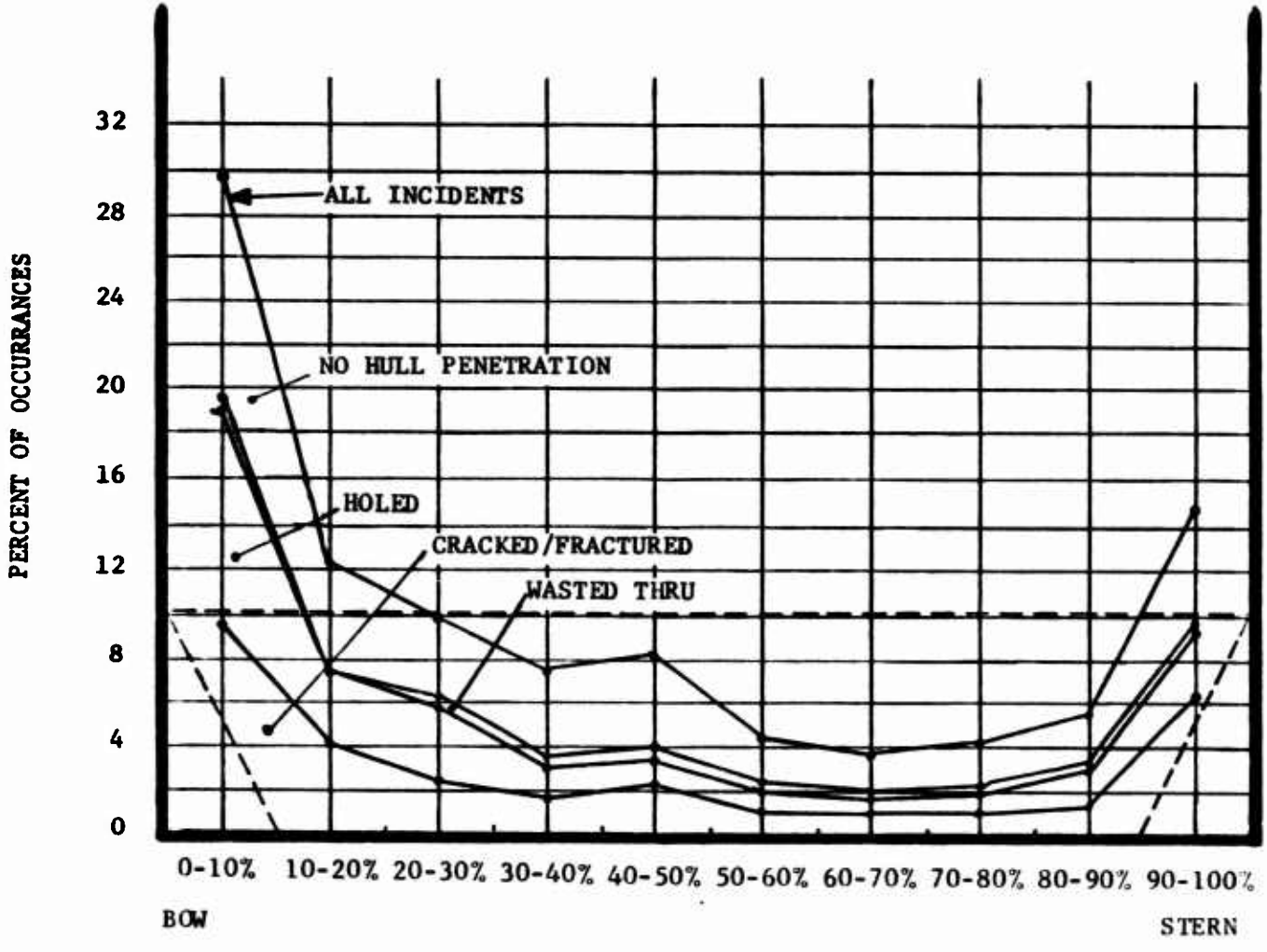


EXHIBIT 5. FREQUENCY OF HULL RUPTURE IN MAJOR BARGE AREAS





LENGTH INTERVAL ALONG BARGE IN WINCH DAMAGE CENTER IS LOCATED - PERCENT OF LENGTH REFERENCED FROM BOW

EXHIBIT 6. GRAPH SHOWING DISTRIBUTION OF DAMAGE INCIDENT CENTER LOCATION ALONG BARGE - BY TYPE OF DAMAGE

- Cracks/fractures - ≈ 8.7 percent
- Holes - ≈ 8.7 percent
- Wasted through - ≈ 0.2 percent
- Dents/Upsets, etc. - ≈ 12.6 percent

  Total - ≈ 30 percent.

This exhibit shows the expected pattern of high incidence near the ends of the barge--with heavy bias toward the bow--diminishing as one approaches the barge mid-section. This pattern holds not only for all damage, but also for each specific type of damage--with the exception of wasted-through hull rupture. This is because this type of damage is most prevalent on the bottom of the barge due to corrosion and erosion. This is not as location oriented as other, more dynamic damage types where frequencies would be expected to increase as the exposure is increased--as, for example, bow and side exposure to dynamic forces of fleeting and locking, as well as collision casualties.

Exhibit 6 also shows the trend of diminished severity of damage on the mid-section as compared to the end portions of the barge. In the bow 10 percent interval, nearly two-thirds of all damages resulted in a hull rupture; whereas, in the mid-section, this ratio drops to approximately one-half. This may also be explainable by the types of damages reported. Wastage and severe distortions become repairable defects prior to becoming hull ruptures--i.e., the damage may be progressive. Dynamic failures, however, do not have this characteristic.

These exhibits show the types of damages and their location--yielding insight into the types of temporary repairs which might be made, where they might occur, and the damage environment in which they must survive. This latter is important to assessing the adequacy of any temporary repair and must, therefore, be considered in defining data needs and test procedures for temporary repair materials.

4.2 FURTHER DEFINITION OF SIDE-DAMAGE LOCATIONS

Because of the dominance of side damage, this damage mode was investigated further in terms of a longitudinal and vertical matrix showing frequency of various side-damage types.* Exhibits D-9 through D-12 show the SALTS results of these analyses. Summary data are shown in Exhibits 7 through 9 for hull ruptures, cracks/fractures, and holes, respectively. Wasted-through damage is not displayed because of the low frequency of occurrence on the side plane (four cases).

In Exhibits 7 through 9, the abscissa is again percentage intervals of the barge-side profile. The ordinate, however, is given in feet. While a percentage display might be useful, such was not possible owing to the number of cases in which a barge depth dimension was lacking in the Vessel File. Furthermore, absolute vertical location dimensions may, in fact, be more meaningful because of draft restrictions on most barge routes which tend to make barge depth fairly uniform across the total population.

These exhibits do not display any particular unique damage profile. As might be expected, cracks and fractures (Exhibit 8) seem to cluster near the ends and along the upper portion of the barge. This is reasonable because of the exposure of these areas to the impact forces which produce these failures.

Holes, on the other hand, tend to be more uniform with a cluster tendency at the ends and along the bottom half of the barge. Again, this is reasonable because of striking, submerged, or floating objects which can produce this type of damage.

From the standpoint of temporary repair, however, these differences are of little consequence. It appears that, regardless of the specific damage to be repaired, equal consideration of water chemical and abrasion resistance and hydrostatic pressure resistance must be given because of the incidence of all damages expected below the water line.

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* It should be mentioned that similar matrix evaluations for other areas, while perhaps desirable, were not possible due to the lack of appropriate data.

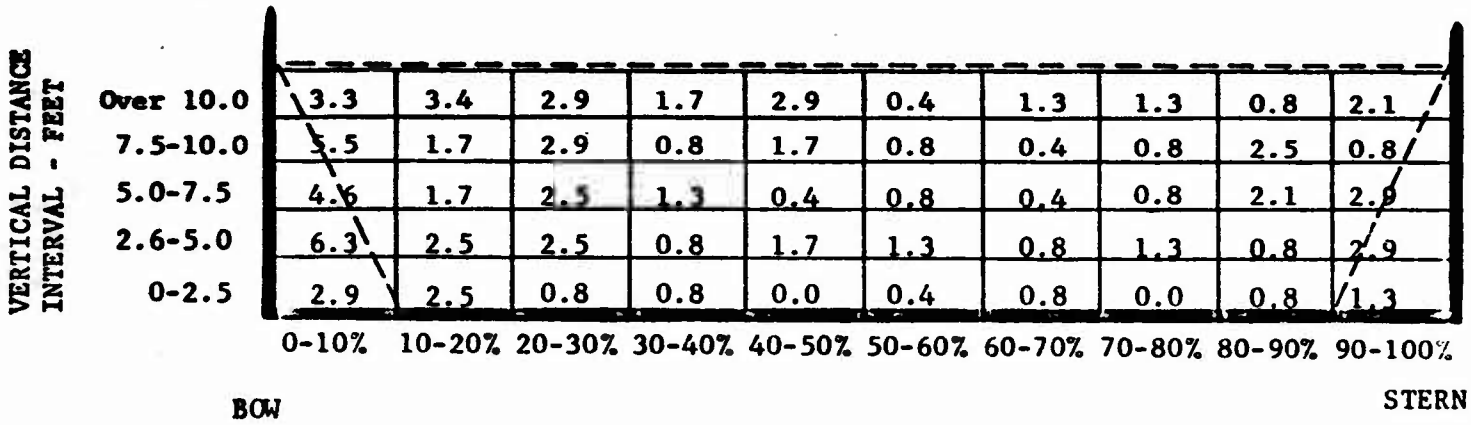
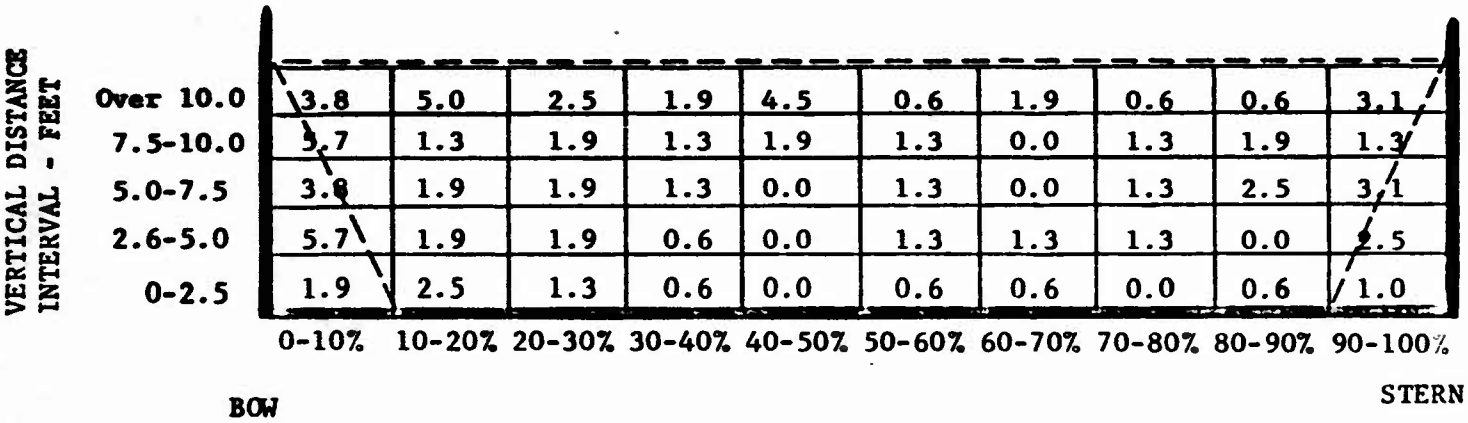


EXHIBIT 7. MATRIX SHOWING DISTRIBUTION OF HULL RUPTURES ON SIDE PLANE

Cells Indicate Percent of Total Incidents of Side Hull Ruptures Occurring in Specified Side Zones



LENGTH INTERVAL ALONG BARGE--PERCENT OF LENGTH REFERENCED TO BOW

EXHIBIT 8. MATRIX SHOWING DISTRIBUTION OF CRACKS/FRACTURES ON SIDE PLANE

Cells Indicate Percent of Total Incidents of Side Cracks/Fractures Occurring in Specified Side Zones

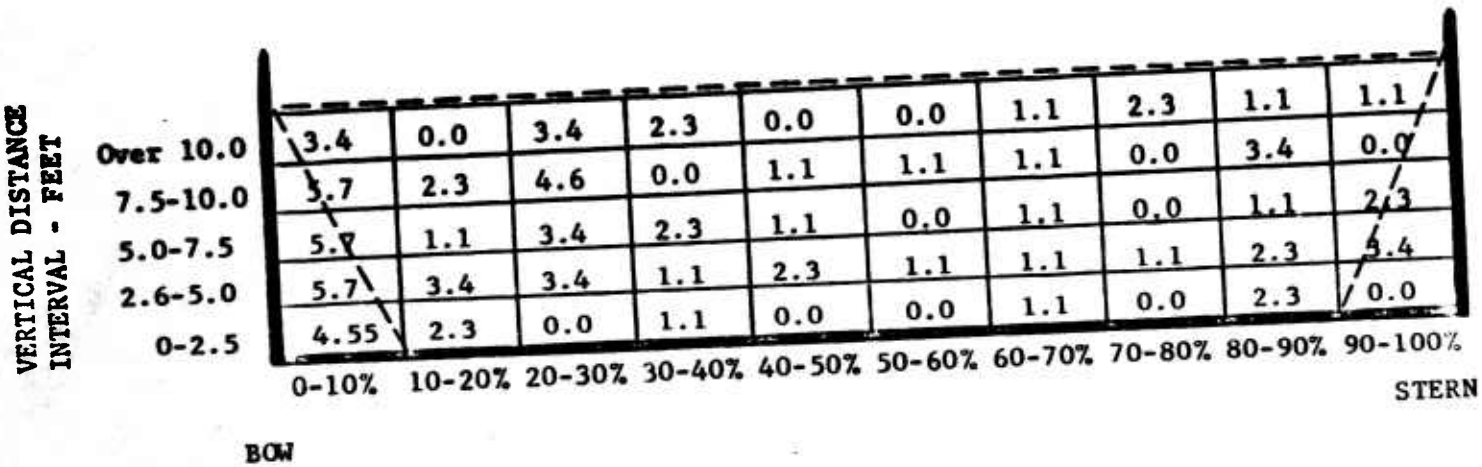


EXHIBIT 9. MATRIX SHOWING DISTRIBUTION OF HOLES ON SIDE PLANE

Cells Indicate Percent of Total Incidents of Side Holes Occurring in Specified Side Zones

4.3 HULL-RUPTURE EXTENT

Another significant damage profile parameter required for the development of test procedures for temporary repair materials is the extent of the hull rupture--or size of the hole over which the temporary repair must maintain water-tight integrity and, perhaps, provide for structural continuity. Therefore, hull ruptures were examined to determine their size characteristics. Crack lengths were taken to be the diagonal of a rectangle containing the crack. Holed damage and wasted-through damage were taken to be the area of the rectangle containing the rupture.

Exhibits D-13, D-14, and D-15 are the SALTS results of these analyses. Exhibit 10 summarizes the results of the crack length investigation. As can be seen, approximately one-third of all cracks are less than one-foot long. However, this is on the low side--owing to the large number of cracks for which appropriate dimensions were not supplied in the survey reports. If it is assumed that the "unknown" category is distributed proportionately over the known length intervals, the percentage of cracks under one foot in length is over 50 percent. This length is highlighted because it would appear that if the cost and complexity of test requirements for temporary repairs to cracks is highly sensitive to the length of the crack, it would be reasonable to concentrate on the small ones. Contacts with barge industry representatives have also indicated that these are likely candidates for temporary repair. Larger cracks will generally be the result of more extensive damage which requires permanent repairs.

Exhibit 11 summarizes the results of the investigation of the area of holed and wasted-through damage. Again, the dominance is at the small end--under one square foot. While there is a clustering of data at the larger end, these must be largely discounted because they generally occurred in the presence of more massive damage--not all of which was rupture area. For example, a damage might have been termed "dented and holed" with the damage dimensions given in the survey reports applicable to the entire distorted area--not the extent of the rupture itself. Therefore, while the precise values cannot be determined, it is reasonable to assume that the

EXHIBIT 10. CRACK LENGTH--FREQUENCY OF OCCURRENCE BY SPECIFIED LENGTH INTERVALS

Crack Length, feet	Percent of Crack Occurrences
Under 1	31.44
1-3	11.01
3-6	6.43
6-10	3.91
Over 10	9.63
Unknown	37.87

EXHIBIT 11. DAMAGE AREA--FREQUENCY OF OCCURRENCE OF DAMAGE TYPES IN SPECIFIED AREA INTERVALS

Area, ft^2	Percent of Occurences	
	Holed	Wasted Through
Under 1	28.24	22.73
1-2	2.89	--
2-3	2.31	--
3-5	4.60	9.10
5-10	8.92	4.55
10-100	22.47	45.47
Over 100 + unknown	29.70	18.20

proportion of actual hull rupture of less than one square foot area is considerably greater than depicted in Exhibit 11.

Therefore, concentration on the small area openings should receive highest priority should compromises on the scope of the temporary repair material tests be required.

APPENDIX A

TANK BARGE DAMAGE CODE SHEET AND EXPLANATIONS

TANK BARGE DAMAGE SURVEY DATA FORM

1. Vessel ID(1-8)

2. Case Incident(9-10)

3. Type of Damage(11-12)=C-Cracked/Fractured
H-Holed D-Deformed/Dented/Upset/Set In
W-Wasted T-Wasted Through U-Unknown

4. Damage Area=S-Side B-Bottom D-Deck
E-End R-Rake N-Stern Notch
I-Internal Bulkhead
Face Only(13)

Knuckle/Corner(14-16)

5. Damage Center Location Reference
End(17)=B-Bow S-Stern U-Unknown

6. First Damage Type - Center Location
Longitudinal from End(18-21)

Vertical from Bottom(22-24)

Transverse from Center Line(25-27)
First Damage Type - Extent
Longitudinal(28-31)

Vertical(32-34)

Transverse(35-37)

7. Second Damage Type - Center Location
Longitudinal from End(38-41)

Vertical from Bottom(42-44)

Transverse from Center Line(45-47)
Second Damage Type - Extent
Longitudinal(48-51)

Vertical(52-54)

Transverse(55-57)

8. Double Barrier=Y-Yes N-No U-Unknown
Side(58)

Bottom(59)

End(60)

9. Tank Penetrated=Y-Yes N-No/Threatened
U-Unknown X-No/Not Threatened
Side(61)

Bottom(62)

End(63)

10. Double Barrier Prevent Tank Penetration=
Y-Yes N-No/Threatened P-Possible
U-Unknown X-No/Not Threatened
blank-Already Double Barrier
Side(64)

Bottom(65)

End(66)

All(67)

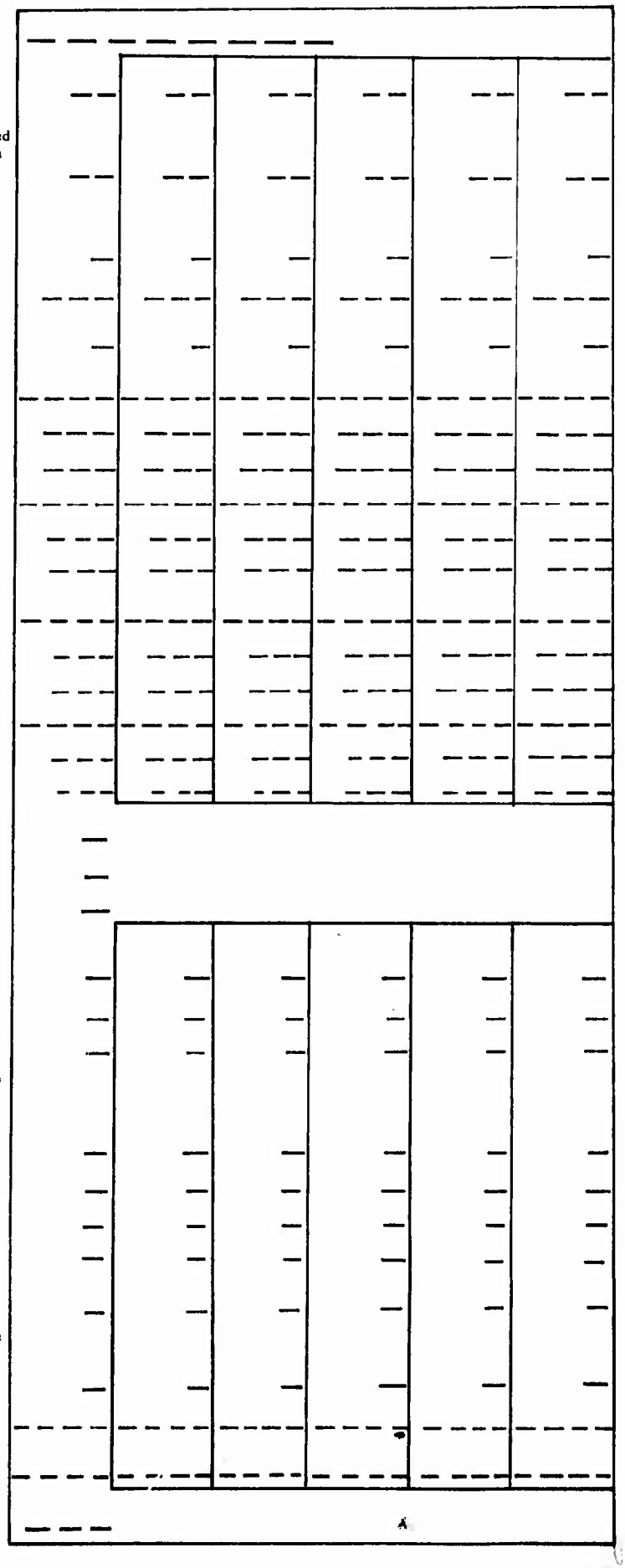
11. Tank Loaded When Damaged(68)=Y-Yes
N-No U-Unknown X-Not Applicable

12. Cause of Damage(69)=F-Structural Failure
C-Collision R-Ramming G-Grounding
H-Hit Submerged Object A-Cargo Action
S-Service/Wear O-Other U-Unknown

13. Cost of Repair(70-73)

14. Weight of Repair Materials(74-77)

15. Sequence Number(78-80)



TANK BARGE DAMAGE SURVEY DATA FORM - CODING EXPLAINATION/RULES

TBDSDF Ques. No.	TBDSDF Question		Corresponding Inspection		Explaination
	General	Detail	No.	Question	
1	Vessel ID		N/A	Official Number	• Code in CC1-2 either DN (document number) or CG (Coast Guard) • Code in 3-8 official number - always 6 digits
2	Case Incident		1 3	profile diagram location of damage	• determine individual damages for one barge (within the same sequence no) and number incident sequentially starting with 01 in CC 9-10 • always zero fill if number is less than 10
3	Damage Type		2	Type of Damage	• in cc 11-12 left justified code types of damage from general to specific. • if only one type leave CC 12 blank and all of question 7 blank • Code the following letters for inspection report answers H-holed, punctured, pinhole C-cracked, fracture, hairline D-deformed, indented, dented, upset (plate), set in (plate), distorted W-general wastage, wasted, wear and tear that does not penetrate barrier T-wastage that penetrated through barrier U-if question is not answered, or answered improperly
4	Damage Area	Face only	1 3	profile diagram location of damage	• answer in CC 13 only if damage is limited to one surface • respond with S(side), B(bottom), D(deck), E(end), R(rake), N(stern-tug knotch), I(internal bulkhead, walls of cargo tanks)
		Knuckle Corner	1 3	profile diagram location of damage	• answer in CC 14-16 if damage covers more than one surface. • respond with combination of 2 or 3 of above surface codes

TANK BARGE DAMAGE SURVEY DATA FORM - CODING EXPLAINATION/RULES (Continued)

TBDSDF Ques. No.	TBDSDF Question		Corresponding Inspection		Explaination
	General	Detail	No.	Question	
5	Damage center location		1	profile section	respond in CC 17 S(stern), B(Bow) or U(unknown)
6					• question 6 is to be coded only for the type of damage coded in CC 11 (i.e., the first type of damage) (question 7 is for second type)* • when coding fields in tenths of feet use the following rules: code inches (converted to tenths of feet) in the right most column of the field code feet in the 3 left most columns (if 4 column field) or 2 left most (if 3 column field) code all 9's if field is unknown code all 9's with last digit 8 for all values the exceed field limit leave blank if not applicable (i.e., if deck damaged code only longitudinal and transverse;if side code longitudinal and vertical; if knuckle only one of the three (longitudinal, transverse or vertical) are coded; if end damaged code vertical and transverse) all 3 fields must be coded for rake damage* • Blank fill, right adjust fields* • if a damage location area is answered the corresponding damage extent must be answered*
	first damage -location	longitudinal from end	3a	longitudinally	• code in CC 18-21 in tenths of feet the distance of damage from nearest end
		vertical from bottom	3b	vertical	• code in CC 22-24 in tenths of feet the distance of damage from the bottom
		transverse from center	1	cross section	• code in CC 25-27 in tenths of feet the distance of damage from the center line (separation port starbound)
	first damage -extent	longitudinal	3c	longitudinal	• code in 28-31 in tenths of feet the longitudinal extent (area covered) of damage
		vertical	3d	vertical extent	• code 32-34 in tenths of feet the vertical extent of damage
		transverse	3e	transverse extent	• code in 35-37 in tenths of feet the transverse extent of damage.

A-13

TANK BARGE DAMAGE SURVEY DATA FORM - CODING EXPLAINATION/RULES (Continued)

TBDSDF Ques. No.	TBDSDF Question		Corresponding Inspection		Explaination
	General	Detail	No.	Question	
7					• question 7 is answered only if an answer was coded for secondary type of damage (i.e., CC 12) • *See general coding explaination -question 6 • coding rules for individual section in question 7 are the same as corresponding section in question 6.
	second damage -location	longitudinal from end	3a	longitudinally	• code in CC 38-71
		vertical from bottom	3b	vertical	• code in CC 42-44
		transverse from center	1	corss section	• code in CC 45-47
	first damage -extent	longitudinal	3c	longitudinal	• code in CC 48-51
		vertical	3d	vertical extent	• code in CC 52-54
		transverse	3e	transverse extent	• code in CC 55-57
8	Double Barrier	side	4	single/double sided	• in CC 58 code Y(yes) if double sided, N(No) if single side, U(Unknown) if unknown
		bottom	5	single/double bottom	• in CC 59 code Y(yes) if double bottomed, N(No) if single bottom, U(Unknown) if unknown
		end	6 1	tank contain cargo profile section	• if response to inspection question 6 is "end void" then code in CC 60 Y(Yes) for double rake or end, N(No) for single rake or end U(Unknown) if cannot tell.
9	Tank Penetrated	side	4a	penetrate side	• in CC 61 code Y(Yes) if penetrated, N(No) if not penetrated but threatened, U(Unknown) if left blank, X(N/A) if not penetrated and not threatened
		bottom	5a	penetrate bottom	• in CC 62 code Y, N, U, or X (same as for penetrated side)
		end	6 1	tank contain cargo profile section	• if response to inspection question 6 is penetrated end void code in CC 63 Y(yes), if cannot tell code U(Unknown).

TANK BARGE DAMAGE SURVEY DATA FORM - CODING EXPLAINATION/RULES (Continued)

TBDSDF Ques. No.	TBDSDF Question		Corresponding Inspection		Explanation
	General	Detail	No.	Question	
10	Double Barrier Prevent Penetration	side	4b	prevent side penetration	• respond to this only if CC 58 was coded N(No) • in CC 64 respond Y(Yes), N(No but threatened) P(possibly, maybe), U(Unknown), X(No-not threatened)
		bottom	5c	prevent bottom penetration	• respond to this only if CC 59 was coded N(No) • in CC 65 respond Y, N, P, U, or X (same as for prevent side penetration)
		end	6	tank contain cargo profile section	• respond to this only if CC 60 was coded N(No) • in CC 66 respond Y, N, P, U, or X (same as for prevent side penetration
		all	4b 5b	prevent side prevent bottom	• respond to this only if CC 58 and 59 were coded N(No) and damage was to a side bottom knuckle area (CC 14-16 were code S,B)
11	Tank Loaded When Damaged		6(second part)	tank carry cargo when damage	• in CC 67 code Y(Yes), N(No), U(Unknown), X (not applicable)
12	Cause of Damage		7	cause of damage	• in CC 68 code the following letters for inspection report answers C-Collision R-Ramming, hitting nonsubmerged stationary object (locks, docks, etc) G-Grounding H-Hit submerged objects (rocks, etc.) F-Structural failure (bad welds and/or repairs) A-Cargo Action (shift in tanks causing damage) S-In service, deterioration, wear and tear, tug action, rough service O-Other miscellaneous causes U-Unknown

TANK BARGE DAMAGE SURVEY DATA FORM - CODING EXPLAINATION/RULES (Continued)

TBDSDF Ques. No.	TBDSDF Question		Corresponding Inspection		Explaination
	General	Detail	No.	Question	
13	Cost of Repairs		8(first part)	cost of repairs	• respond in tens of dollars (round off to nearest tens) • if greater than $100,000 code 9998 • if unknown code 9999 • if multiple incidents occur and cost is for total repair code amount in incident 01 and leave all subsequent incident cost blank • code answer in CC 70-73 right adjusted, blank filled
14	Weight of repair materials		8(second part)	weight of repair materials	• respond in tens of pounds (round off to nearest tens) • if greater than 100,000 pounds code 9998 • if unknown code 9999 • if multiple incident occur and pounds is for total repair code weight in incident 01 and leave all subsequent incident weights blank • code answer in CC 74-77 right justified, blank filled
15	Sequence number		N/A	hand written in upper corner	• code in CC 78-80 3 digit sequence number (which range from 100 to 850)

APPENDIX B

TANK BARGE SALTS DATA RECORD LAYOUT

TANK BARGE DAMAGE SURVEY RECORD FORMAT

SALTS FIELD		SALTS RECORD		ORIGAN		SALTS FIELD		SALTS RECORD		ORIGAN	
No.	Wid	Position	Description	CRD(COL)	Wid	No.	Wid	Position	Description	CRD(COL)	Wid
1	2	1-2	Vessel ID Type	1(1-2)	2	40	2	113-114	Design Speed	3(27-28)	2
2	2	3-4	Vessel ID	1(3-8)	6	41	2	115-116	Type Propulsion	3(29-30)	2
3	4	5-8				42	1	117	Number of Boilers	3(31)	1
4	4	9-12	Sort Field	1(9-17)	9	43	1	118	Type Wheel	3(32)	1
5	1	13				44	1	119	Number of Shafts	3(33)	1
6	4	14-17				45	1	120	Stern Bearing/Kort Nozzel	3(34)	1
7	4	18-21	Vessel Name	1(18-49)	32	46	1	121	Position/Thruster	3(35)	1
8	4	22-25				47	1	122	Skeg/Flanking	3(36)	1
9	4	26-29				48	1	123	Bridge	3(37)	1
10	4	30-33				49	1	124	E/R Automation	3(38)	1
11	4	34-37				50	1	125	Auto Tension	3(39)	1
12	4	38-41				51	1	126	Gaging	3(40)	1
13	4	42-45				52	1	127	Vents	3(41)	1
14	4	46-49				53	1	128	Number of Pumps	3(42)	1
15	4	50-53	Place Built-City/County	2(2-15)	14	54	3	129-131	Capacity	3(48-54)	7
16	4	54-57				55	4	132-135			
17	4	58-61				56	1	136	Units	3(55)	1
18	2	62-63				57	1	137	Highest Grade	3(56)	1
19	2	64-65	Place Built-ST/For	2(16-17)	2	58	1	138	Highest Grade	3(57)	1
20	4	66-69	Year Built	2(18-21)	4	59	1	139	Rake Grade	3(58)	1
21	3	70-72	Vessel Class (Type)	2(22-24)	3	60	1	140	Deck Tank	3(59)	1
22	4	73-76	Vessel Class	2(25-28)	4	61	1	141	Number Tanks Across	3(60)	1
23	1	77	Subchapter	2(29)	1	62	2	142-143	Number Tanks Lengthwise	3(61-62)	2
24	1	78	Barge Hull	2(30)	1	63	1	144	Intergral/Independent	3(63)	1
25	1	79	Registered Length	2(46-50)	5	64	1	145	Elevated Pressure	3(64)	1
26	4	80-83				65	1	146	Temperature	3(65)	1
27	4	84-87	Breadth (MLD)	2(51-54)	4	66	1	147	Insulated	3(66)	1
28	4	88-91	Registered Breadth	2(55-58)	4	67	1	148	Boiler/Ref.	3(67)	1
29	3	92-94	Depth (MLD)	2(59-61)	3	68	2	149-150	Number of Holds	3(68-69)	2
30	3	95-97	Draft Design	2(62-64)	3	69	1	151	Desk Openings	3(70)	1
31	3	98-100	Registered Depth	2(65-67)	3	70	4	152-155	Owner	4(7-31)	25
32	2	101-102	Gross	3(3-8)	6	71	4	156-159			
33	4	103-106				72	4	160-163			
34	1	107	Hull Material	3(21)	1	73	4	164-167			
35	1	108	Special Material	3(22)	1	74	4	168-171			
36	1	109	Fore Body	3(23)	1	75	4	172-175			
37	1	110	Ice Strengthened	3(24)	1	76	1	176			
38	1	111	Double Sides	3(25)	1	77	4	177-180	Operator	4(32-56)	25
39	1	112	Double Bottom	3(26)	1	78	4	181-184			

TANK BARGE DAMAGE SURVEY RECORD FORMAT

.TS FIELD		SALTS RECORD		ORIGAN		SALTS FIELD		SALTS RECORD		ORIGAN	
No.	Wid	Position	Description	CRD(COL)	Wid	No.	Wid	Position	Description	CRD(COL)	Wid
79	4	185-188				118	1	285	Damage Area-Face	6(13)	1
80	4	189-192				119	3	286-288	Damage Area-Knuckle	6(14-16)	3
81	4	193-196				120	1	289	Damage Location	6(17)	1
82	4	197-200				121	4	290-293	1st Longitudinal Location	6(18-21)	4
83	1	201				122	3	294-296	1st Vertical Location	6(22-24)	3
84	4	202-205	Operator-Street Address	4(57-76)	20	123	3	297-299	1st Transverse Location	6(25-27)	3
85	4	206-209				124	4	300-303	1st Rearward Location	[created]	4
86	4	210-213				125	4	304-307	1st Longitudinal Extent	6(28-31)	4
87	4	214-217				126	3	308-310	1st Vertical Extent	6(32-34)	3
88	4	218-221				127	3	311-313	1st Transverse Extent	6(35-37)	3
89	4	222-225	Operator City	4(77-80)	14	128	4	314-317	Individual Damage Area	[created]	8
90	4	226-229		5(1-10)		129	4	318-321			
91	4	230-233				130	4	322-325	Total Damage Area	[created]	8
92	2	234-235				131	4	326-329			
93	2	236-237	Operator State	5(11-12)	2	132	4	330-333	Crack Length	[created]	4
94	4	238-241	Operator Zip	5(13-17)	5	133	4	334-337	2nd Longitudinal Location	6(48-41)	4
95	1	242				134	3	338-340	2nd Vertical Location	6(42-44)	3
96	2	243-244	Certified Year	5(18-19)	2	135	3	341-343	2nd Transverse Location	6(45-47)	3
97	2	245-246	Certified Month	5(20-21)	2	136	4	344-347	2nd Longitudinal Extent	6(78-51)	4
98	2	247-248	Certified Day	5(22-23)	2	137	3	348-350	2nd Vertical Extent	6(52-54)	3
99	3	249-251	Certified OCMI	5(24-26)	3	138	3	351-353	2nd Transverse Extent	6(55-57)	3
100	2	252-253	Inspection Due Year	5(27-28)	2	139	1	354	Double Barrier Side	6(58)	1
101	2	254-255	Inspection Due Month	5(29-30)	2	140	1	355	Double Barrier Bottom	6(59)	1
102	2	256-257	Inspection Due Day	5(31-32)	2	141	1	356	Double Barrier End	6(60)	1
103	2	258-259	Last Dry Dock Year	5(42-43)	2	142	1	357	Tank Penetrated Side	6(61)	1
104	2	260-261	Last Dry Dock Month	5(44-45)	2	143	1	358	Tank Penetrated Bottom	6(62)	1
105	3	262-264	Last Dry Dock OCMI	5(46-48)	3	144	1	359	Tank Penetrated End	6(63)	1
106	2	265-266	Route	5(56-57)	2	145	1	360	Double Prevent Pen. Side	6(64)	1
107	2	267-268	Date Last Update Month	5(72-73)	2	146	1	361	Double Prevent Pen. Bottom	6(65)	1
108	1	269	Date Last Update (/)	5(74)	1	147	1	362	Double Prevent Pen. End	6(66)	1
109	2	270-271	Date Last Update Day	5(75-76)	2	148	1	363	Double Prevent Pen. All	6(67)	1
110	1	272	Date Last Update (/)	5(77)	1	149	1	364	Tank Loaded When damage	6(68)	1
111	2	273-274	Date Last Update Year	5(78-79)	2	150	1	365	Cause of Damage	6(69)	1
112	1	275	Status	5(80)	1	151	4	366-369	Individual Cost	6(70-73)	4
113	2	276-277	Incident Number	6(9-10)	2	152	4	370-373	Total Cost	[created]	4
114	2	278-279	Total Number Incident	[created]	2	153	4	374-377	Individual Weight	6(74-77)	4
115	3	280-282	Sequence Number	6(78-80)	3	154	4	378-381	Total Weight	[created]	4
116	1	283	Damage Type (First)	6(11)	1	155	4	382-385	1st Rearward Locat. %	[created]	4
117	1	284	Damage Type (Second)	6(12)	1	156	4	386-389	1st Longitudinal Locat. %	[created]	4

APPENDIX C

SALTS ANALYSIS EVENT DEFINITIONS

```
SALTS 2.10 SESSION: 11/04/74  09:56:24
  PASSWORD?                RDL
/RESIDENT
/◆POOL
  POOL FILE NAME?          TBP1
THE FOLLOWING FILES ARE CORE RESIDENT
POOL FILE : TBP1
DATA BASE FILE : TKBG
/◆EXIT
/DISPLAY
/◆EVENTS

POOL NAME : TBP1
POOL DATA BASE : TKBG
POOL LEGEND : TANK BARGE POOL
MAXIMUM NUMBER OF EVENTS :  97
POOL UPDATE :   13

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
  EVENT NAME?              ALL
EVENT NAME    : RUP
EVENT LEGEND  : HULL-RUPTURED
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  :    Y,   Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : NRUP
EVENT LEGEND  : HULL-NOT-RUPTURED
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  :    N,   N.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PAS
EVENT LEGEND  : DAMAG-PLANE-SIDE
NUM. FIELDS   :    2

FIELD   1     :   118
NUM. CONDS.   :     1 INCL
CONDITION  1  : S,S.

FIELD   2     :   119
NUM. CONDS.   :     2 INCL
CONDITION  1  : RS ,RS .
CONDITION  2  : SR ,SR .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : PAE
EVENT LEGEND  : DAMAG-PLANE-END
NUM. FIELDS   :    2

FIELD   1     :   118
NUM. CONDS.   :     1 INCL
CONDITION  1  : E,E.

FIELD   2     :   119
NUM. CONDS.   :     2 INCL
CONDITION  1  : PE ,RE .
CONDITION  2  : ER ,ER .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PAB
EVENT LEGEND  : DAMAG-PLANE-BOTTOM
NUM. FIELDS   :    1

FIELD   1     :   118
NUM. CONDS.   :     1 INCL
CONDITION  1  : B,B.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PAD
EVENT LEGEND  : DAMAG-PLANE-DECK
NUM. FIELDS   :    1

FIELD   1     :   118
NUM. CONDS.   :     1 INCL
CONDITION  1  : D,D.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : KSD
EVENT LEGEND  : DAMAG-KNUCKL-SIDDECK
NUM. FIELDS   :    1

FIELD   1     :   119
NUM. CONDS.   :     5 INCL
CONDITION  1  : SD ,SD .
CONDITION  2  : DS ,DS .
CONDITION  3  : RDS,RDS.
CONDITION  4  : RSD,RSD.
CONDITION  5  : DSR,DSR.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : KSB
EVENT LEGEND  : DAMAG-KNUCKL-SIDEBOT
NUM. FIELDS   :    1

FIELD   1     :   119
NUM. CONDS.   :     2 INCL
CONDITION  1  : SB ,SB .
CONDITION  2  : BS ,BS .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : KED
EVENT LEGEND : DAMAG-KNUCKL-ENDDECK
NUM. FIELDS   :     1

FIELD    1     :   119
NUM. CONDS.   :      6 INCL
CONDITION   1 : DE ,DE .
CONDITION   2 : ED ,ED .
CONDITION   3 : RD ,RD .
CONDITION   4 : DRE,DRE.
CONDITION   5 : RDE,RDE.
CONDITION   6 : RED,RED.

************************************
EVENT NAME    : KES
EVENT LEGEND : DAMAG-KNUCKL-ENDSIDE
NUM. FIELDS   :     1

FIELD    1     :   119
NUM. CONDS.   :      6 INCL
CONDITION   1 : SE ,SE .
CONDITION   2 : ES ,ES .
CONDITION   3 : RES,RES.
CONDITION   4 : RSE,RSE.
CONDITION   5 : SRE,SRE.
CONDITION   6 : SER,SER.

************************************
EVENT NAME    : KEB
EVENT LEGEND : DAMAG-KNUCKL-ENDBOTT
NUM. FIELDS   :     1

FIELD    1     :   119
NUM. CONDS.   :      8 INCL
CONDITION   1 : BE ,BE .
CONDITION   2 : EB ,EB .
CONDITION   3 : RB ,RB .
CONDITION   4 : BR ,BR .
CONDITION   5 : RBE,RBE.
CONDITION   6 : REB,REB.
CONDITION   7 : ERB,ERB.
CONDITION   8 : BRE,BRE.

************************************
EVENT NAME    : UPC
EVENT LEGEND : DAMAG-KNUCKL-UPCORNR
NUM. FIELDS   :     1

FIELD    1     :   119
NUM. CONDS.   :      4 INCL
CONDITION   1 : EDS,EDS.
CONDITION   2 : DSE,DSE.
CONDITION   3 : ESD,ESD.
CONDITION   4 : SED,SED.

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```
EVENT NAME    : LWC
EVENT LEGEND  : DAMAG-KNUCKL-LWCORNR
NUM. FIELDS   :    1

FIELD   1     :   119
NUM. CONDS.   :     8 INCL
CONDITION  1  : EBS,EBS.
CONDITION  2  : ESB,ESB.
CONDITION  3  : BSE,BSE.
CONDITION  4  : RSB,RSB.
CONDITION  5  : BRS,BRS.
CONDITION  6  : BSR,BSR.
CONDITION  7  : RBS,RBS.
CONDITION  8  : SRB,SRB.
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : COM
EVENT LEGEND  : DAMAG-COMPOUND
NUM. FIELDS   :    1

FIELD   1     :   119
NUM. CONDS.   :     4 INCL
CONDITION  1  : DSB,DSB.
CONDITION  2  : BSD,BSD.
CONDITION  3  : SDB,SDB.
CONDITION  4  : SBS,SBS.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : DS
EVENT LEGEND  : DOUBL-BARRIER-SIDE
NUM. FIELDS   :    1

FIELD   1     :   139
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : DB
EVENT LEGEND  : DOUBL-BARRIER-BOTTOM
NUM. FIELDS   :    1

FIELD   1     :   140
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : DE
EVENT LEGEND  : DOUBL-BARRIER-END
NUM. FIELDS   :    1

FIELD   1     :   141
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : SS
EVENT LEGEND  : SINGL-BARRIER-SIDE
NUM. FIELDS   :     1

FIELD   1     :    139
NUM. CONDS.   :      1 INCL
CONDITION  1  : N,N.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : SB
EVENT LEGEND  : SINGL-BARRIER-BOTTOM
NUM. FIELDS   :     1

FIELD   1     :    140
NUM. CONDS.   :      1 INCL
CONDITION  1  : N,N.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : SE
EVENT LEGEND  : SINGL-BARRIER-END
NUM. FIELDS   :     1

FIELD   1     :    141
NUM. CONDS.   :      1 INCL
CONDITION  1  : N,N.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : UE
EVENT LEGEND  : UNKNOWN-BARRIER-END
NUM. FIELDS   :     1

FIELD   1     :    141
NUM. CONDS.   :      1 INCL
CONDITION  1  : U,U.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : SP
EVENT LEGEND  : SIDE-PENTRATION
NUM. FIELDS   :     1

FIELD   1     :    142
NUM. CONDS.   :      1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : BP
EVENT LEGEND  : BOTTOM-PENTRATION
NUM. FIELDS   :     1

FIELD   1     :    143
NUM. CONDS.   :      1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : EP
EVENT LEGEND  : END-PENTRATION
NUM. FIELDS   :     1

FIELD   1     :    144
NUM. CONDS.   :      1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : EV
EVENT LEGEND  : END-VOID-AREA
NUM. FIELDS   :     1

FIELD   1     :    142
NUM. CONDS.   :      1 EXCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : NSP
EVENT LEGEND  : NO-SIDE-PENTRATION
NUM. FIELDS   :     1

FIELD   1     :    142
NUM. CONDS.   :      2 INCL
CONDITION  1  : N,N.
CONDITION  2  : X,X.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PDS
EVENT LEGEND  : DOUBL-SIDE-PREVENT
NUM. FIELDS   :     1

FIELD   1     :    145
NUM. CONDS.   :      2 INCL
CONDITION  1  : Y,Y.
CONDITION  2  : P,P.
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PDB
EVENT LEGEND  : DOUBL-BOTTOM-PREVENT
NUM. FIELDS   :     1

FIELD   1     :    146
NUM. CONDS.   :      2 INCL
CONDITION  1  : Y,Y.
CONDITION  2  : P,P.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : PDE
EVENT LEGEND  : DOUBL-END-PREVENT
NUM. FIELDS   :    1

FIELD   1     :   147
NUM. CONDS.   :     2 INCL
CONDITION  1  : Y,Y.
CONDITION  2  : P,P.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : PSB
EVENT LEGEND  : DOUBL-SIDE/BOTT-PREV
NUM. FIELDS   :    1

FIELD   1     :   148
NUM. CONDS.   :     2 INCL
CONDITION  1  : Y,Y.
CONDITION  2  : P,P.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : TP
EVENT LEGEND  : TANK-PENETRATION-GEN
NUM. FIELDS   :    3

FIELD   1     :   142
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

FIELD   2     :   143
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

FIELD   3     :   144
NUM. CONDS.   :     1 INCL
CONDITION  1  : Y,Y.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : LAKE
EVENT LEGEND  : RT-LAKES-BAYS-SOUNDS
NUM. FIELDS   :    1

FIELD   1     :   106
NUM. CONDS.   :     1 INCL
CONDITION  1  : L ,L .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : COAS
EVENT LEGEND  : RT-COASTWISE
NUM. FIELDS   :    1

FIELD   1     :   106
NUM. CONDS.   :     1 INCL
CONDITION  1  : C ,C .
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EVENT NAME    : OCEN
EVENT LEGEND  : RT-OCEANS
NUM. FIELDS   :     1

FIELD   1     :    106
NUM. CONDS.   :      1 INCL
CONDITION  1  : O ,O .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : RIVR
EVENT LEGEND  : RT-RIVERS
NUM. FIELDS   :     1

FIELD   1     :    106
NUM. CONDS.   :      1 INCL
CONDITION  1  : R ,R .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : GLAK
EVENT LEGEND  : RT-GREAT-LAKES
NUM. FIELDS   :     1

FIELD   1     :    106
NUM. CONDS.   :      1 INCL
CONDITION  1  : G ,G .

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : CRAK
EVENT LEGEND  : DAMAG-CRACK
NUM. FIELDS   :     2

FIELD   1     :    116
NUM. CONDS.   :      1 INCL
CONDITION  1  : C,C.

FIELD   2     :    117
NUM. CONDS.   :      1 INCL
CONDITION  1  : C,C.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : HOLE
EVENT LEGEND  : DAMAG-HOLED
NUM. FIELDS   :     2

FIELD   1     :    116
NUM. CONDS.   :      1 INCL
CONDITION  1  : H,H.

FIELD   2     :    117
NUM. CONDS.   :      1 INCL
CONDITION  1  : H,H.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : WHOL
EVENT LEGEND  : DAMAG-WASTED-THROUGH
NUM. FIELDS   :     1

FIELD   1     :    116
NUM. CONDS.   :      1 INCL
CONDITION  1  : T,T.
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : DENT
EVENT LEGEND  : DAMAG-DENTED,UPSET
NUM. FIELDS   :     1

FIELD   1     :    116
NUM. CONDS.   :      1 INCL
CONDITION  1  : D,D.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : WAST
EVENT LEGEND  : DAMAG-WASTED
NUM. FIELDS   :     1

FIELD   1     :    116
NUM. CONDS.   :      1 INCL
CONDITION  1  : W,W.

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EVENT NAME    : R25
EVENT LEGEND  : REAR-REACH=LT-25-FT
NUM. FIELDS   :     1

FIELD   1     :    124
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0250.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : R50
EVENT LEGEND  : REAR-REACH=25-50-FT
NUM. FIELDS   :     1

FIELD   1     :    124
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0251,0500.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : R75
EVENT LEGEND  : REAR-REACH=50-75-FT
NUM. FIELDS   :     1

FIELD   1     :    124
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0501,0750.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : R100
EVENT LEGEND  : REAR-REACH=75-100-FT
NUM. FIELDS   :     1

FIELD   1     :    124
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0751,1000.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : R500
EVENT LEGEND  : REAR-REACH=GT-100-FT
NUM. FIELDS   :     1

FIELD   1     :    124
NUM. CONDS.   :      1 INCL
CONDITION  1  : 1001,5000.
◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : BOW
EVENT LEGEND  : DAMAGE-FROM-BOW
NUM. FIELDS   :     1

FIELD   1     :    120
NUM. CONDS.   :      1 EXCL
CONDITION  1  : S,S.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : STER
EVENT LEGEND  : DAMAGE-FROM-STERN
NUM. FIELDS   :     1

FIELD   1     :    120
NUM. CONDS.   :      1 INCL
CONDITION  1  : S,S.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : C25
EVENT LEGEND  : CENTER=LT-25-FT
NUM. FIELDS   :     1

FIELD   1     :    121
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0250.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : C50
EVENT LEGEND  : CENTER=25-50-FT
NUM. FIELDS   :     1

FIELD   1     :    121
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0251,0500.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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(46)

(48)

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EVENT NAME    : C75
EVENT LEGEND  : CENTER=50-75-FT
NUM. FIELDS   :     1

FIELD   1     :    121
NUM. CONDS.   :       1 INCL
CONDITION  1  : 0501,0750.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : C100
EVENT LEGEND  : CENTER=75-100-FT
NUM. FIELDS   :     1

FIELD   1     :    121
NUM. CONDS.   :       1 INCL
CONDITION  1  : 0751,1000.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : C500
EVENT LEGEND  : CENTER=GT-100-FT
NUM. FIELDS   :     1

FIELD   1     :    121
NUM. CONDS.   :       1 INCL
CONDITION  1  : 1001,5000.

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EVENT NAME    : BOW1
EVENT LEGEND  : DAMAGE-FROM-BOW-ONLY
NUM. FIELDS   :     1

FIELD   1     :    120
NUM. CONDS.   :       1 INCL
CONDITION  1  : B,B.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : UNKR
EVENT LEGEND  : DAMAGE-UNKNOWN-END
NUM. FIELDS   :     1

FIELD   1     :    120
NUM. CONDS.   :       1 INCL
CONDITION  1  : U,U.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : V25
EVENT LEGEND  : VERT-FROM-BOTT=LT-25
NUM. FIELDS   :     1

FIELD   1     :    122
NUM. CONDS.   :       1 INCL
CONDITION  1  : 000,025.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : V50
EVENT LEGEND  : VERT-FROM-BOTT=25-50
NUM. FIELDS   :     1

FIELD   1     :    122
NUM. CONDS.   :      1 INCL
CONDITION  1  : 026,050.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : V75
EVENT LEGEND  : VERT-FROM-BOTT=50-75
NUM. FIELDS   :     1

FIELD   1     :    122
NUM. CONDS.   :      1 INCL
CONDITION  1  : 051,075.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : V100
EVENT LEGEND  : VERT-FROM-BOT=75-100
NUM. FIELDS   :     1

FIELD   1     :    122
NUM. CONDS.   :      1 INCL
CONDITION  1  : 076,100.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : V500
EVENT LEGEND  : VERT-FROM-BOT=GT-100
NUM. FIELDS   :     1

FIELD   1     :    122
NUM. CONDS.   :      1 INCL
CONDITION  1  : 101,500.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : L100
EVENT LEGEND  : IAREA=LT-100-FT
NUM. FIELDS   :     1

FIELD   1     :    128
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0000.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : ALT1
EVENT LEGEND  : IAREA=0-1-FT
NUM. FIELDS   :     1

FIELD   1     :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0100.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
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EVENT NAME    : ALT2
EVENT LEGEND  : IAREA=1-2-FT
NUM. FIELDS   :     1

FIELD   1     :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0101,0200.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : ALT3
EVENT LEGEND  : IAREA=2-3-FT
NUM. FIELDS   :     1

FIELD   1     :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0201,0300.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : ALT5
EVENT LEGEND  : IAREA=3-5-FT
NUM. FIELDS   :     1

FIELD   1     :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0301,0500.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : AL10
EVENT LEGEND  : IAREA=5-10-FT
NUM. FIELDS   :     1

FIELD   1     :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0501,1000.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : LLT1
EVENT LEGEND  : CRACK-LENG=LT-1-FT
NUM. FIELDS   :     1

FIELD   1     :    132
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0010.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : LLT3
EVENT LEGEND  : CRACK-LENG=1-3-FT
NUM. FIELDS   :     1

FIELD   1     :    132
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0011,0030.

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EVENT NAME    : LLT6
EVENT LEGEND  : CRACK-LENG=3-6-FT
NUM. FIELDS   :     1

FIELD    1    :    132
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0031,0060.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : LL10
EVENT LEGEND  : CRACK-LENG=6-10-FT
NUM. FIELDS   :     1

FIELD    1    :    132
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0061,0100.

◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆
EVENT NAME    : AG10
EVENT LEGEND  : IAREA=GT-10-FT
NUM. FIELDS   :     1

FIELD    1    :    129
NUM. CONDS.   :      1 INCL
CONDITION  1  : 1001,9997.

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EVENT NAME    : LG10
EVENT LEGEND  : CRACK-LENG=GT-10-FT
NUM. FIELDS   :     1

FIELD    1    :    132
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0101,9997.

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EVENT NAME    : RUPT
EVENT LEGEND  : HULL-RUPTURED
NUM. FIELDS   :     1

FIELD    1    :    157
NUM. CONDS.   :      1 INCL
CONDITION  1  :     Y,    Y.

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EVENT NAME    : RUPN
EVENT LEGEND  : HULL-NOT-RUPTURED
NUM. FIELDS   :     1

FIELD    1    :    157
NUM. CONDS.   :      1 INCL
CONDITION  1  :     N,    N.
```

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EVENT NAME    : CDYN
EVENT LEGEND  : DYNAMIC-CAUS-G/R/C/H
NUM. FIELDS   :     1

FIELD    1    :    150
NUM. CONDS.   :      4 INCL
CONDITION  1  : G,G.
CONDITION  2  : R,R.
CONDITION  3  : C,C.
CONDITION  4  : H,H.

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EVENT NAME    : CSF
EVENT LEGEND  : STRUCT-FAILURE-CAUSE
NUM. FIELDS   :     1

FIELD    1    :    150
NUM. CONDS.   :      1 INCL
CONDITION  1  : F,F.

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EVENT NAME    : CSER
EVENT LEGEND  : IN-SERVICE-CAUSE
NUM. FIELDS   :     1

FIELD    1    :    150
NUM. CONDS.   :      1 INCL
CONDITION  1  : S,S.

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EVENT NAME    : CCA
EVENT LEGEND  : CARGO-ACTION-CAUSE
NUM. FIELDS   :     1

FIELD    1    :    150
NUM. CONDS.   :      1 INCL
CONDITION  1  : A,A.

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EVENT NAME    : CP10
EVENT LEGEND  : CLONG-LENGTH=0-10%
NUM. FIELDS   :     1

FIELD    1    :    156
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0000,0010.

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EVENT NAME    : CP20
EVENT LEGEND  : CLONG-LENGTH=11-20%
NUM. FIELDS   :     1

FIELD    1    :    156
NUM. CONDS.   :      1 INCL
CONDITION  1  : 0011,0020.
```

(51)

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EVENT NAME    : CP40
EVENT LEGEND  : CLONG-LENGTH=31-40%
NUM. FIELDS   :    1

FIELD   1     :   156
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0031,0040.

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EVENT NAME    : CP50
EVENT LEGEND  : CLONG-LENGTH=41-50%
NUM. FIELDS   :    1

FIELD   1     :   156
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0041,0050.

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EVENT NAME    : CP60
EVENT LEGEND  : CLONG-LENGTH=51-60%
NUM. FIELDS   :    1

FIELD   1     :   156
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0051,0060.

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EVENT NAME    : CP70
EVENT LEGEND  : CLONG-LENGTH=61-70%
NUM. FIELDS   :    1

FIELD   1     :   156
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0061,0070.

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EVENT NAME    : CP99
EVENT LEGEND  : CLONG-LENGTH=71-100%
NUM. FIELDS   :    1

FIELD   1     :   156
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0071,0100.

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EVENT NAME    : BOTM
EVENT LEGEND  : VERTICAL EXTENT L.T.
NUM. FIELDS   :    1

FIELD   1     :   126
NUM. CONDS.   :     1 INCL
CONDITION  1  : 000,020.

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EVENT NAME    : V20
EVENT LEGEND  : VERTICAL C.L. L.T. 2
NUM. FIELDS   :    1

FIELD   1     :   122
NUM. CONDS.   :     1 INCL
CONDITION  1  : 000,020.

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EVENT NAME    : V10
EVENT LEGEND  : VERTICAL C.L. L.T. 1
NUM. FIELDS   :    1

FIELD   1     :   122
NUM. CONDS.   :     1 INCL
CONDITION  1  : 000,010.

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EVENT NAME    : RP10
EVENT LEGEND  : RLONG-LENGTH=0-10%
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0000,0010.

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EVENT NAME    : RP20
EVENT LEGEND  : RLONG-LENGTH=11-20%
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0011,0020.

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EVENT NAME    : RP30
EVENT LEGEND  : RLONG-LENGTH=21-30%
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0021,0030.

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EVENT NAME    : RP40
EVENT LEGEND  : RLONG-LENGTH=31-40%
NUM. FIELDS   :    1

FIELD   1     :   155
NUM. CONDS.   :     1 INCL
CONDITION  1  : 0031,0040.

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EVENT NAME    : RP50
EVENT LEGEND  : RLONG-LENGTH=41-50%
NUM. FIELDS   :     1

FIELD    1    :   155
NUM. CONDS.   :      1 INCL
CONDITION   1 : 0041,0050.

************************************
EVENT NAME    : RP60
EVENT LEGEND  : RLONG-LENGTH=51-60%
NUM. FIELDS   :     1

FIELD    1    :   155
NUM. CONDS.   :      1 INCL
CONDITION   1 : 0051,0060.
```

APPENDIX D

SALTS ANALYSIS RESULTS

EXHIBIT D-1. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM BOW--ALL DAMAGE

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEV0	BOW1	100.00	869	1289	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	244	244	0	28.08	0.	28.08	28.08
3	PAB	PAB	7.14	179	179	0	20.60	0.	20.60	20.60
4	PAD	PAD	7.14	30	30	0	3.45	0.	3.45	3.45
5	PHE	PAE	7.14	93	93	0	10.70	0.	10.70	10.70
6	KSB	KSB	7.14	96	96	0	11.05	0.	11.05	11.05
7	KSD	KSD	7.14	59	59	0	6.79	0.	6.79	6.79
8	KES	KES	7.14	46	46	0	5.29	0.	5.29	5.29
9	KED	KED	7.14	28	28	0	3.22	0.	3.22	3.22
10	KEB	KEB	7.14	42	42	0	4.83	0.	4.83	4.83
11	UPC	UPC	7.14	7	7	0	.81	0.	.81	.81
12	LWC	LWC	7.14	28	28	0	3.22	0.	3.22	3.22
13	COM	COM	7.14	8	8	0	.92	0.	.92	.92
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	9	9	0	1.04	0.	1.04	1.04
16	10A	CP10	10.00	78	78	0	8.98	0.	8.98	31.97
17	20A	CP20	10.00	44	44	0	5.06	0.	5.06	18.03
18	30A	CP30	10.00	35	35	0	4.03	0.	4.03	14.34
19	40A	CP40	10.00	27	27	0	3.11	0.	3.11	11.07
20	50A	CP50	10.00	26	26	0	2.99	0.	2.99	10.66
21	60A	CP60	10.00	13	13	0	1.50	0.	1.50	5.33
22	70A	CP70	10.00	3	3	0	.35	0.	.35	1.23
23	99A	CP99	10.00	2	2	0	.23	0.	.23	.82
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	16	16	0	1.84	0.	1.84	6.56
26	10B	CP10	10.00	17	17	0	1.96	0.	1.96	9.50
27	20B	CP20	10.00	47	47	0	5.41	0.	5.41	26.26
28	30B	CP30	10.00	30	30	0	3.45	0.	3.45	16.76
29	40B	CP40	10.00	35	35	0	4.03	0.	4.03	19.55
30	50B	CP50	10.00	29	29	0	3.34	0.	3.34	16.20
31	60B	CP60	10.00	8	8	0	.92	0.	.92	4.47
32	70B	CP70	10.00	3	3	0	.35	0.	.35	1.68
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	10	10	0	1.15	0.	1.15	5.59
36	10C	CP10	10.00	10	10	0	1.15	0.	1.15	33.33
37	20C	CP20	10.00	5	5	0	.58	0.	.58	16.67
38	30C	CP30	10.00	6	6	0	.69	0.	.69	20.00
39	40C	CP40	10.00	3	3	0	.35	0.	.35	10.00
40	50C	CP50	10.00	3	3	0	.35	0.	.35	10.00
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	3	3	0	.35	0.	.35	10.00
46	10D	CP10	10.00	41	41	0	4.72	0.	4.72	44.09
47	20D	CP20	10.00	7	7	0	.81	0.	.81	7.53
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	45	45	0	5.18	0.	5.18	48.39
56	10E	CP10	10.00	12	12	0	1.38	0.	1.38	12.50
57	20E	CP20	10.00	24	24	0	2.76	0.	2.76	25.00
58	30E	CP30	10.00	15	15	0	1.73	0.	1.73	15.63
59	40E	CP40	10.00	10	10	0	1.15	0.	1.15	10.42
60	50E	CP50	10.00	23	23	0	2.65	0.	2.65	23.96
61	60E	CP60	10.00	4	4	0	.46	0.	.46	4.17

EXHIBIT D-1. (Continued)

62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.
65	$$$$		10.00	8	8	0	.92	0.	.92	8.33
66	10F	CP10	10.00	15	15	0	1.73	0.	1.73	25.42
67	20F	CP20	10.00	5	5	0	.58	0.	.58	8.47
68	30F	CP30	10.00	12	12	0	1.38	0.	1.38	20.34
69	40F	CP40	10.00	10	10	0	1.15	0.	1.15	16.95
70	50F	CP50	10.00	8	8	0	.92	0.	.92	13.56
71	60F	CP60	10.00	3	3	0	.35	0.	.35	5.08
72	70F	CP70	10.00	1	1	0	.12	0.	.12	1.69
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	5	5	0	.58	0.	.58	8.47
76	10G	CP10	10.00	19	19	0	2.19	0.	2.19	41.30
77	20G	CP20	10.00	2	2	0	.23	0.	.23	4.35
78	30G	CP30	10.00	1	1	0	.12	0.	.12	2.17
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	24	24	0	2.76	0.	2.76	52.17
86	10H	CP10	10.00	2	2	0	.23	0.	.23	7.14
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	26	26	0	2.99	0.	2.99	92.86
96	10I	CP10	10.00	18	18	0	2.07	0.	2.07	42.86
97	20I	CP20	10.00	8	8	0	.92	0.	.92	19.05
98	30I	CP30	10.00	2	2	0	.23	0.	.23	4.76
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	1	1	0	.12	0.	.12	2.38
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	13	13	0	1.50	0.	1.50	30.95
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	1	1	0	.12	0.	.12	14.29
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	1	1	0	.12	0.	.12	14.29
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	5	5	0	.58	0.	.58	71.43
116	10K	CP10	10.00	17	17	0	1.96	0.	1.96	60.71
117	20K	CP20	10.00	5	5	0	.58	0.	.58	17.86
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	2	2	0	.23	0.	.23	7.14
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-1 (Continued)

125	$$$$		10.00	4	4	0	.46	0.	.46	14.29
126	10L	CP10	10.00	1	1	0	.12	0.	.12	12.50
127	20L	CP20	10.00	1	1	0	.12	0.	.12	12.50
128	30L	CP30	10.00	0	0	0	0.	0.	0.	0.
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	3	3	0	.35	0.	.35	37.50
131	60L	CP60	10.00	1	1	0	.12	0.	.12	12.50
132	70L	CP70	10.00	1	1	0	.12	0.	.12	12.50
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	1	1	0	.12	0.	.12	12.50

EXHIBIT D-2. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM BOW--HULL RUPTURES

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEVO	PUPT	100.00	497	869	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	157	157	0	31.59	0.	31.59	31.59
3	PAB	PAB	7.14	90	90	0	18.11	0.	18.11	18.11
4	PAD	PAD	7.14	15	15	0	3.02	0.	3.02	3.02
5	PAE	PAE	7.14	57	57	0	11.47	0.	11.47	11.47
6	KSB	KS	7.14	48	48	0	9.66	0.	9.66	9.66
7	KSD	KSD	7.14	30	30	0	6.04	0.	6.04	6.04
8	KES	KES	7.14	23	23	0	4.63	0.	4.63	4.63
9	KED	KED	7.14	24	24	0	4.83	0.	4.83	4.83
10	KEB	KEB	7.14	21	21	0	4.23	0.	4.23	4.23
11	UPC	UPC	7.14	4	4	0	.80	0.	.80	.80
12	LWC	LWC	7.14	17	17	0	3.42	0.	3.42	3.42
13	COM	COM	7.14	6	6	0	1.21	0.	1.21	1.21
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	5	5	0	1.01	0.	1.01	1.01
16	10A	CP10	10.00	57	57	0	11.47	0.	11.47	36.31
17	20A	CP20	10.00	28	28	0	5.63	0.	5.63	17.83
18	30A	CP30	10.00	28	28	0	5.63	0.	5.63	17.83
19	40A	CP40	10.00	12	12	0	2.41	0.	2.41	7.64
20	50A	CP50	10.00	15	15	0	3.02	0.	3.02	9.55
21	60A	CP60	10.00	8	8	0	1.61	0.	1.61	5.10
22	70A	CP70	10.00	2	2	0	.40	0.	.40	1.27
23	99A	CP99	10.00	1	1	0	.20	0.	.20	.64
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	6	6	0	1.21	0.	1.21	3.82
26	10B	CP10	10.00	11	11	0	2.21	0.	2.21	12.22
27	20B	CP20	10.00	27	27	0	5.43	0.	5.43	30.00
28	30B	CP30	10.00	14	14	0	2.82	0.	2.82	15.56
29	40B	CP40	10.00	18	18	0	3.62	0.	3.62	20.00
30	50B	CP50	10.00	13	13	0	2.62	0.	2.62	14.44
31	60B	CP60	10.00	3	3	0	.60	0.	.60	3.33
32	70B	CP70	10.00	0	0	0	0.	0.	0.	0.
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	4	4	0	.80	0.	.80	4.44
36	10C	CP10	10.00	5	5	0	1.01	0.	1.01	33.33
37	20C	CP20	10.00	2	2	0	.40	0.	.40	13.33
38	30C	CP30	10.00	1	1	0	.20	0.	.20	6.67
39	40C	CP40	10.00	1	1	0	.20	0.	.20	6.67
40	50C	CP50	10.00	3	3	0	.60	0.	.60	20.00
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	3	3	0	.60	0.	.60	20.00
46	10D	CP10	10.00	19	19	0	3.82	0.	3.82	33.33
47	20D	CP20	10.00	1	1	0	.20	0.	.20	1.75
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-2. (Continued)

55	$$$$		10.00	37	37	0	7.44	0.	7.44	64.91
56	10E	CP10	10.00	8	8	0	1.61	0.	1.61	16.67
57	20E	CP20	10.00	12	12	0	2.41	0.	2.41	25.00
58	30E	CP30	10.00	11	11	0	2.21	0.	2.21	22.92
59	40E	CP40	10.00	2	2	0	.40	0.	.40	4.17
60	50E	CP50	10.00	9	9	0	1.81	0.	1.81	18.75
61	60E	CP60	10.00	2	2	0	.40	0.	.40	4.17
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.
65	$$$$		10.00	4	4	0	.80	0.	.80	8.33
66	10F	CP10	10.00	7	7	0	1.41	0.	1.41	23.33
67	20F	CP20	10.00	4	4	0	.80	0.	.80	13.33
68	30F	CP30	10.00	4	4	0	.80	0.	.80	13.33
69	40F	CP40	10.00	7	7	0	1.41	0.	1.41	23.33
70	50F	CP50	10.00	4	4	0	.80	0.	.80	13.33
71	60F	CP60	10.00	1	1	0	.20	0.	.20	3.33
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	3	3	0	.60	0.	.60	10.00
76	10G	CP10	10.00	6	6	0	1.21	0.	1.21	26.09
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	17	17	0	3.42	0.	3.42	73.91
86	10H	CP10	10.00	2	2	0	.40	0.	.40	8.33
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	22	22	0	4.43	0.	4.43	91.67
96	10I	CP10	10.00	7	7	0	1.41	0.	1.41	33.33
97	20I	CP20	10.00	5	5	0	1.01	0.	1.01	23.81
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	1	1	0	.20	0.	.20	4.76
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	8	8	0	1.61	0.	1.61	38.10
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-2 (Continued)

115	$$$$		10.00	4	4	0	.80	0.	.80	100.00
116	10K	CP10	10.00	9	9	0	1.81	0.	1.81	52.94
117	20K	CP20	10.00	4	4	0	.80	0.	.80	23.53
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	4	4	0	.80	0.	.80	23.53
126	10L	CP10	10.00	1	1	0	.20	0.	.20	16.67
127	20L	CP20	10.00	1	1	0	.20	0.	.20	16.67
128	30L	CP30	10.00	0	0	0	0.	0.	0.	0.
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	2	2	0	.40	0.	.40	33.33
131	60L	CP60	10.00	1	1	0	.20	0.	.20	16.67
132	70L	CP70	10.00	1	1	0	.20	0.	.20	16.67
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-3. LOGIC DIAGRAM FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM BOW--CRACKS

NODE NAME?				ABL						
NO.	NAME	EVENT	WEIGHT	--P--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVO	BOW1	100.00	280	436	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	101	101	0	36.07	0.	36.07	36.07
3	PAB	PAB	7.14	41	41	0	14.64	0.	14.64	14.64
4	PAD	PAD	7.14	8	8	0	2.86	0.	2.86	2.86
5	PAE	PAE	7.14	31	31	0	11.07	0.	11.07	11.07
6	KSB	KSB	7.14	25	25	0	8.93	0.	8.93	8.93
7	KSD	KSD	7.14	24	24	0	8.57	0.	8.57	8.57
8	KES	KES	7.14	13	13	0	4.64	0.	4.64	4.64
9	KED	KED	7.14	14	14	0	5.00	0.	5.00	5.00
10	KEB	KEB	7.14	7	7	0	2.50	0.	2.50	2.50
11	UPC	UPC	7.14	3	3	0	1.07	0.	1.07	1.07
12	LWC	LWC	7.14	6	6	0	2.14	0.	2.14	2.14
13	COM	COM	7.14	4	4	0	1.43	0.	1.43	1.43
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	3	3	0	1.07	0.	1.07	1.07
16	10A	CP10	10.00	35	35	0	12.50	0.	12.50	34.65
17	20A	CP20	10.00	20	20	0	7.14	0.	7.14	19.80
18	30A	CP30	10.00	15	15	0	5.36	0.	5.36	14.85
19	40A	CP40	10.00	8	8	0	2.86	0.	2.86	7.92
20	50A	CP50	10.00	9	9	0	3.21	0.	3.21	8.91
21	60A	CP60	10.00	7	7	0	2.50	0.	2.50	6.93
22	70A	CP70	10.00	1	1	0	.36	0.	.36	.99
23	99A	CP99	10.00	1	1	0	.36	0.	.36	.99
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	5	5	0	1.79	0.	1.79	4.95
26	10B	CP10	10.00	4	4	0	1.43	0.	1.43	9.76
27	20B	CP20	10.00	13	13	0	4.64	0.	4.64	31.71
28	30B	CP30	10.00	8	8	0	2.86	0.	2.86	19.51
29	40B	CP40	10.00	6	6	0	2.14	0.	2.14	14.63
30	50B	CP50	10.00	8	8	0	2.86	0.	2.86	19.51
31	60B	CP60	10.00	1	1	0	.36	0.	.36	2.44
32	70B	CP70	10.00	0	0	0	0.	0.	0.	0.
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	1	1	0	.36	0.	.36	2.44
36	10C	CP10	10.00	2	2	0	.71	0.	.71	25.00
37	20C	CP20	10.00	1	1	0	.36	0.	.36	12.50
38	30C	CP30	10.00	1	1	0	.36	0.	.36	12.50
39	40C	CP40	10.00	0	0	0	0.	0.	0.	0.
40	50C	CP50	10.00	2	2	0	.71	0.	.71	25.00
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	2	2	0	.71	0.	.71	25.00
46	10D	CP10	10.00	5	5	0	1.79	0.	1.79	16.13
47	20D	CP20	10.00	1	1	0	.36	0.	.36	3.23
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	25	25	0	8.93	0.	8.93	80.65
56	10E	CP10	10.00	3	3	0	1.07	0.	1.07	12.00
57	20E	CP20	10.00	7	7	0	2.50	0.	2.50	28.00
58	30E	CP30	10.00	7	7	0	2.50	0.	2.50	28.00
59	40E	CP40	10.00	1	1	0	.36	0.	.36	4.00
60	50E	CP50	10.00	5	5	0	1.79	0.	1.79	20.00
61	60E	CP60	10.00	1	1	0	.36	0.	.36	4.00
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-3. (Continued)

65	$$$$		10.00	1	1	0	.36	0.	.36	4.00
66	10F	CP10	10.00	5	5	0	1.79	0.	1.79	20.83
67	20F	CP20	10.00	4	4	0	1.43	0.	1.43	16.67
68	30F	CP30	10.00	3	3	0	1.07	0.	1.07	12.50
69	40F	CP40	10.00	6	6	0	2.14	0.	2.14	25.00
70	50F	CP50	10.00	3	3	0	1.07	0.	1.07	12.50
71	60F	CP60	10.00	1	1	0	.36	0.	.36	4.17
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	2	2	0	.71	0.	.71	8.33
76	10G	CP10	10.00	3	3	0	1.07	0.	1.07	23.08
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	10	10	0	3.57	0.	3.57	76.92
86	10H	CP10	10.00	0	0	0	0.	0.	0.	0.
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	14	14	0	5.00	0.	5.00	100.00
96	10I	CP10	10.00	2	2	0	.71	0.	.71	28.57
97	20I	CP20	10.00	2	2	0	.71	0.	.71	28.57
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	3	3	0	1.07	0.	1.07	42.86
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	3	3	0	1.07	0.	1.07	100.00
116	10K	CP10	10.00	2	2	0	.71	0.	.71	33.33
117	20K	CP20	10.00	2	2	0	.71	0.	.71	33.33
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	2	2	0	.71	0.	.71	33.33
126	10L	CP10	10.00	1	1	0	.36	0.	.36	25.00
127	20L	CP20	10.00	1	1	0	.36	0.	.36	25.00
128	30L	CP30	10.00	0	0	0	0.	0.	0.	0.
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	0	0	0	0.	0.	0.	0.
131	60L	CP60	10.00	1	1	0	.36	0.	.36	25.00
132	70L	CP70	10.00	1	1	0	.36	0.	.36	25.00
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-4. LOGIC TREE FOR ANALYZING DAMAGE
CENTERLINE FROM BOW--HOLES

NODE NO.	NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEVO	BOW1	100.00	244	347	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	62	62	0	25.41	0.	25.41	25.41
3	PAB	PAP	7.14	51	51	0	20.90	0.	20.90	20.90
4	PAD	PAD	7.14	8	8	0	3.28	0.	3.28	3.28
5	PAE	PAE	7.14	30	30	0	12.30	0.	12.30	12.30
6	KSB	KSB	7.14	29	29	0	11.89	0.	11.89	11.89
7	KSD	KSD	7.14	7	7	0	2.87	0.	2.87	2.87
8	KES	KES	7.14	11	11	0	4.51	0.	4.51	4.51
9	KED	KED	7.14	12	12	0	4.92	0.	4.92	4.92
10	KEB	KEB	7.14	18	18	0	7.38	0.	7.38	7.38
11	UPC	UPC	7.14	1	1	0	.41	0.	.41	.41
12	LWC	LWC	7.14	10	10	0	4.10	0.	4.10	4.10
13	COM	COM	7.14	3	3	0	1.23	0.	1.23	1.23
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	2	2	0	.82	0.	.82	.82
16	10A	CP10	10.00	24	24	0	9.84	0.	9.84	38.71
17	20A	CP20	10.00	8	8	0	3.28	0.	3.28	12.90
18	30A	CP30	10.00	13	13	0	5.33	0.	5.33	20.97
19	40A	CP40	10.00	6	6	0	2.46	0.	2.46	9.68
20	50A	CP50	10.00	4	4	0	1.64	0.	1.64	6.45
21	60A	CP60	10.00	3	3	0	1.23	0.	1.23	4.84
22	70A	CP70	10.00	2	2	0	.82	0.	.82	3.23
23	99A	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	2	2	0	.82	0.	.82	3.23
26	10B	CP10	10.00	7	7	0	2.87	0.	2.87	13.73
27	20B	CP20	10.00	15	15	0	6.15	0.	6.15	29.41
28	30B	CP30	10.00	6	6	0	2.46	0.	2.46	11.76
29	40B	CP40	10.00	14	14	0	5.74	0.	5.74	27.45
30	50B	CP50	10.00	4	4	0	1.64	0.	1.64	7.84
31	60B	CP60	10.00	2	2	0	.82	0.	.82	3.92
32	70B	CP70	10.00	0	0	0	0.	0.	0.	0.
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	3	3	0	1.23	0.	1.23	5.88
36	10C	CP10	10.00	3	3	0	1.23	0.	1.23	37.50
37	20C	CP20	10.00	2	2	0	.82	0.	.82	25.00
38	30C	CP30	10.00	0	0	0	0.	0.	0.	0.
39	40C	CP40	10.00	1	1	0	.41	0.	.41	12.50
40	50C	CP50	10.00	1	1	0	.41	0.	.41	12.50
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	1	1	0	.41	0.	.41	12.50
46	10D	CP10	10.00	14	14	0	5.74	0.	5.74	46.67
47	20D	CP20	10.00	0	0	0	0.	0.	0.	0.
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	16	16	0	6.56	0.	6.56	53.33
56	10E	CP10	10.00	5	5	0	2.05	0.	2.05	17.24
57	20E	CP20	10.00	6	6	0	2.46	0.	2.46	20.69
58	30E	CP30	10.00	6	6	0	2.46	0.	2.46	20.69
59	40E	CP40	10.00	1	1	0	.41	0.	.41	3.45
60	50E	CP50	10.00	6	6	0	2.46	0.	2.46	20.69
61	60E	CP60	10.00	2	2	0	.82	0.	.82	6.90
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-4. (Continued)

65	$$$$		10.00	3	3	0	1.23	0.	1.23	10.34
66	10F	CP10	10.00	2	2	0	.82	0.	.82	28.57
67	20F	CP20	10.00	1	1	0	.41	0.	.41	14.29
68	30F	CP30	10.00	2	2	0	.82	0.	.82	28.57
69	40F	CP40	10.00	0	0	0	0.	0.	0.	0.
70	50F	CP50	10.00	1	1	0	.41	0.	.41	14.29
71	60F	CP60	10.00	0	0	0	0.	0.	0.	0.
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	1	1	0	.41	0.	.41	14.29
76	10G	CP10	10.00	3	3	0	1.23	0.	1.23	27.27
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	8	8	0	3.28	0.	3.28	72.73
86	10H	CP10	10.00	2	2	0	.82	0.	.82	16.67
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	10	10	0	4.10	0.	4.10	83.33
96	10I	CP10	10.00	6	6	0	2.46	0.	2.46	33.33
97	20I	CP20	10.00	4	4	0	1.64	0.	1.64	22.22
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	8	8	0	3.28	0.	3.28	44.44
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	1	1	0	.41	0.	.41	100.00
116	10K	CP10	10.00	6	6	0	2.46	0.	2.46	60.00
117	20K	CP20	10.00	2	2	0	.82	0.	.82	20.00
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	2	2	0	.82	0.	.82	20.00
126	10L	CP10	10.00	0	0	0	0.	0.	0.	0.
127	20L	CP20	10.00	1	1	0	.41	0.	.41	33.33
128	30L	CP30	10.00	0	0	0	0.	0.	0.	0.
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	1	1	0	.41	0.	.41	33.33
131	60L	CP60	10.00	0	0	0	0.	0.	0.	0.
132	70L	CP70	10.00	1	1	0	.41	0.	.41	33.33
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-5. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM STERN--ALL DAMAGE

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --R--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVO	STEP	100.00	362	1289	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	94	94	0	25.97	0.	25.97	25.97
3	PAB	PAB	7.14	67	67	0	18.51	0.	18.51	18.51
4	PAD	PAD	7.14	17	17	0	4.70	0.	4.70	4.70
5	PAE	PAE	7.14	41	41	0	11.33	0.	11.33	11.33
6	KSB	KSB	7.14	45	45	0	12.43	0.	12.43	12.43
7	KSD	KSD	7.14	21	21	0	5.80	0.	5.80	5.80
8	KES	KES	7.14	32	32	0	8.84	0.	8.84	8.84
9	KED	KED	7.14	11	11	0	3.04	0.	3.04	3.04
10	KEB	KEB	7.14	7	7	0	1.93	0.	1.93	1.93
11	UPC	UPC	7.14	11	11	0	3.04	0.	3.04	3.04
12	LWC	LWC	7.14	9	9	0	2.49	0.	2.49	2.49
13	COM	COM	7.14	4	4	0	1.10	0.	1.10	1.10
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	3	3	0	.83	0.	.83	.83
16	10A	CP10	10.00	32	32	0	8.84	0.	8.84	34.04
17	20A	CP20	10.00	22	22	0	6.08	0.	6.08	23.40
18	30A	CP30	10.00	14	14	0	3.87	0.	3.87	14.89
19	40A	CP40	10.00	8	8	0	2.21	0.	2.21	8.51
20	50A	CP50	10.00	4	4	0	1.10	0.	1.10	4.26
21	60A	CP60	10.00	3	3	0	.83	0.	.83	3.19
22	70A	CP70	10.00	1	1	0	.28	0.	.28	1.06
23	99A	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	10	10	0	2.76	0.	2.76	10.64
26	10B	CP10	10.00	12	12	0	3.31	0.	3.31	17.91
27	20B	CP20	10.00	15	15	0	4.14	0.	4.14	22.39
28	30B	CP30	10.00	12	12	0	3.31	0.	3.31	17.91
29	40B	CP40	10.00	14	14	0	3.87	0.	3.87	20.90
30	50B	CP50	10.00	7	7	0	1.93	0.	1.93	10.45
31	60B	CP60	10.00	0	0	0	0.	0.	0.	0.
32	70B	CP70	10.00	1	1	0	.28	0.	.28	1.49
33	99B	CP99	10.00	3	3	0	.83	0.	.83	4.48
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	3	3	0	.83	0.	.83	4.48
36	10C	CP10	10.00	5	5	0	1.38	0.	1.38	29.41
37	20C	CP20	10.00	5	5	0	1.38	0.	1.38	29.41
38	30C	CP30	10.00	4	4	0	1.10	0.	1.10	23.53
39	40C	CP40	10.00	1	1	0	.28	0.	.28	5.88
40	50C	CP50	10.00	0	0	0	0.	0.	0.	0.
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	2	2	0	.55	0.	.55	11.76
46	10D	CP10	10.00	8	8	0	2.21	0.	2.21	19.51
47	20D	CP20	10.00	0	0	0	0.	0.	0.	0.
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	33	33	0	9.12	0.	9.12	80.49
56	10E	CP10	10.00	10	10	0	2.76	0.	2.76	22.22
57	20E	CP20	10.00	11	11	0	3.04	0.	3.04	24.44
58	30E	CP30	10.00	8	8	0	2.21	0.	2.21	17.78
59	40E	CP40	10.00	10	10	0	2.76	0.	2.76	22.22
60	50E	CP50	10.00	5	5	0	1.38	0.	1.38	11.11

EXHIBIT D-5. (Continued)

61	60E	CP60	10.00	0	0	0	0.	0.	0.	0.
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.
65	$$$$		10.00	1	1	0	.28	0.	.28	2.22
66	10F	CP10	10.00	5	5	0	1.38	0.	1.38	23.81
67	20F	CP20	10.00	5	5	0	1.38	0.	1.38	23.81
68	30F	CP30	10.00	4	4	0	1.10	0.	1.10	19.05
69	40F	CP40	10.00	2	2	0	.55	0.	.55	9.52
70	50F	CP50	10.00	2	2	0	.55	0.	.55	9.52
71	60F	CP60	10.00	0	0	0	0.	0.	0.	0.
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	3	3	0	.83	0.	.83	14.29
76	10G	CP10	10.00	5	5	0	1.38	0.	1.38	15.63
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	27	27	0	7.46	0.	7.46	84.38
86	10H	CP10	10.00	2	2	0	.55	0.	.55	18.18
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	9	9	0	2.49	0.	2.49	81.82
96	10I	CP10	10.00	4	4	0	1.10	0.	1.10	57.14
97	20I	CP20	10.00	1	1	0	.28	0.	.28	14.29
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	2	2	0	.55	0.	.55	28.57
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	11	11	0	3.04	0.	3.04	100.00
116	10K	CP10	10.00	5	5	0	1.38	0.	1.38	55.56
117	20K	CP20	10.00	2	2	0	.55	0.	.55	22.22
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-5 (Continued)

125	$$$$		10.00	2	2	0	.55	0.	.55	22.22
126	10L	CP10	10.00	0	0	0	0.	0.	0.	0.
127	20L	CP20	10.00	1	1	0	.28	0.	.28	25.00
128	30L	CP30	10.00	2	2	0	.55	0.	.55	50.00
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	1	1	0	.28	0.	.28	25.00
131	60L	CP60	10.00	0	0	0	0.	0.	0.	0.
132	70L	CP70	10.00	0	0	0	0.	0.	0.	0.
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-6. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM STERN--HULL RUPTURE

NODE NO.	NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEVO	PUPT	100.00	227	362	0	100.00	0.	100.00	100.00
2	PAS	PAC	7.14	69	69	0	30.40	0.	30.40	30.40
3	PAB	PAB	7.14	38	38	0	16.74	0.	16.74	16.74
4	PAD	PAD	7.14	10	10	0	4.41	0.	4.41	4.41
5	PAE	PAE	7.14	29	29	0	12.78	0.	12.78	12.78
6	KSB	KSB	7.14	20	20	0	8.81	0.	8.81	8.81
7	KSD	KSD	7.14	13	13	0	5.73	0.	5.73	5.73
8	KES	KEI	7.14	25	25	0	11.01	0.	11.01	11.01
9	KED	KED	7.14	9	9	0	3.96	0.	3.96	3.96
10	KEL	KEB	7.14	0	0	0	0.	0.	0.	0.
11	UPC	UPC	7.14	6	6	0	2.64	0.	2.64	2.64
12	LWC	LWC	7.14	4	4	0	1.76	0.	1.76	1.76
13	COM	COM	7.14	3	3	0	1.32	0.	1.32	1.32
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	1	1	0	.44	0.	.44	.44
16	10A	CP10	10.00	24	24	0	10.57	0.	10.57	34.78
17	20A	CP20	10.00	17	17	0	7.49	0.	7.49	24.64
18	30A	CP30	10.00	9	9	0	3.96	0.	3.96	13.04
19	40A	CP40	10.00	7	7	0	3.08	0.	3.08	10.14
20	50A	CP50	10.00	2	2	0	.88	0.	.88	2.90
21	60A	CP60	10.00	1	1	0	.44	0.	.44	1.45
22	70A	CP70	10.00	1	1	0	.44	0.	.44	1.45
23	99A	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	8	8	0	3.52	0.	3.52	11.59
26	10B	CP10	10.00	7	7	0	3.08	0.	3.08	18.42
27	20B	CP20	10.00	7	7	0	3.08	0.	3.08	18.42
28	30B	CP30	10.00	7	7	0	3.08	0.	3.08	18.42
29	40B	CP40	10.00	10	10	0	4.41	0.	4.41	26.32
30	50B	CP50	10.00	4	4	0	1.76	0.	1.76	10.53
31	60B	CP60	10.00	0	0	0	0.	0.	0.	0.
32	70B	CP70	10.00	1	1	0	.44	0.	.44	2.63
33	99B	CP99	10.00	1	1	0	.44	0.	.44	2.63
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	1	1	0	.44	0.	.44	2.63
36	10C	CP10	10.00	3	3	0	1.32	0.	1.32	30.00
37	20C	CP20	10.00	2	2	0	.88	0.	.88	20.00
38	30C	CP30	10.00	3	3	0	1.32	0.	1.32	30.00
39	40C	CP40	10.00	1	1	0	.44	0.	.44	10.00
40	50C	CP50	10.00	0	0	0	0.	0.	0.	0.
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	1	1	0	.44	0.	.44	10.00
46	10D	CP10	10.00	2	2	0	.88	0.	.88	6.90
47	20D	CP20	10.00	0	0	0	0.	0.	0.	0.
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	27	27	0	11.89	0.	11.89	93.10
56	10E	CP10	10.00	4	4	0	1.76	0.	1.76	20.00
57	20E	CP20	10.00	5	5	0	2.20	0.	2.20	25.00
58	30E	CP30	10.00	5	5	0	2.20	0.	2.20	25.00
59	40E	CP40	10.00	4	4	0	1.76	0.	1.76	20.00
60	50E	CP50	10.00	2	2	0	.88	0.	.88	10.00
61	60E	CP60	10.00	0	0	0	0.	0.	0.	0.
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-6. (Continued)

65	$$$$		10.00	0	0	0	0.	0.	0.	0.
66	10F	CP10	10.00	2	2	0	.88	0.	.88	15.38
67	20F	CP20	10.00	4	4	0	1.76	0.	1.76	30.77
68	30F	CP30	10.00	1	1	0	.44	0.	.44	7.69
69	40F	CP40	10.00	1	1	0	.44	0.	.44	7.69
70	50F	CP50	10.00	2	2	0	.88	0.	.88	15.38
71	60F	CP60	10.00	0	0	0	0.	0.	0.	0.
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	3	3	0	1.32	0.	1.32	23.08
76	10G	CP10	10.00	3	3	0	1.32	0.	1.32	12.00
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	22	22	0	9.69	0.	9.69	88.00
86	10H	CP10	10.00	2	2	0	.88	0.	.88	22.22
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	7	7	0	3.08	0.	3.08	77.78
96	10I	CP10	10.00	0	0	0	0.	0.	0.	0.
97	20I	CP20	10.00	0	0	0	0.	0.	0.	0.
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	0	0	0	0.	0.	0.	0.
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	6	6	0	2.64	0.	2.64	100.00
116	10K	CP10	10.00	2	2	0	.88	0.	.88	50.00
117	20K	CP20	10.00	0	0	0	0.	0.	0.	0.
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	2	2	0	.88	0.	.88	50.00
126	10L	CP10	10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-6 (Continued)

127	20L	CP20	10.00	1	1	0	.44	0.	.44	33.33
128	30L	CP30	10.00	2	2	0	.88	0.	.88	66.67
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	0	0	0	0.	0.	0.	0.
131	60L	CP60	10.00	0	0	0	0.	0.	0.	0.
132	70L	CP70	10.00	0	0	0	0.	0.	0.	0.
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-7. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM STERN--CRACKS/FRACTURES

NODE NO.	NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVO	STEP	100.00	139	436	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	51	51	0	36.69	0.	36.69	36.69
3	PAB	PAB	7.14	13	13	0	9.35	0.	9.35	9.35
4	PAD	PAD	7.14	8	8	0	5.76	0.	5.76	5.76
5	PAE	PAE	7.14	16	16	0	11.51	0.	11.51	11.51
6	KSB	KSB	7.14	12	12	0	8.63	0.	8.63	8.63
7	KSD	KSD	7.14	6	6	0	4.32	0.	4.32	4.32
8	KES	KES	7.14	18	18	0	12.95	0.	12.95	12.95
9	KED	KED	7.14	6	6	0	4.32	0.	4.32	4.32
10	KEB	KEB	7.14	0	0	0	0.	0.	0.	0.
11	UPC	UPC	7.14	6	6	0	4.32	0.	4.32	4.32
12	LWC	LWC	7.14	1	1	0	.72	0.	.72	.72
13	COM	COM	7.14	1	1	0	.72	0.	.72	.72
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	1	1	0	.72	0.	.72	.72
16	10A	CP10	10.00	19	19	0	13.67	0.	13.67	37.25
17	20A	CP20	10.00	9	9	0	6.47	0.	6.47	17.65
18	30A	CP30	10.00	6	6	0	4.32	0.	4.32	11.76
19	40A	CP40	10.00	5	5	0	3.60	0.	3.60	9.80
20	50A	CP50	10.00	2	2	0	1.44	0.	1.44	3.92
21	60A	CP60	10.00	1	1	0	.72	0.	.72	1.96
22	70A	CP70	10.00	1	1	0	.72	0.	.72	1.96
23	99A	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	8	8	0	5.76	0.	5.76	15.69
26	10B	CP10	10.00	1	1	0	.72	0.	.72	7.69
27	20B	CP20	10.00	3	3	0	2.16	0.	2.16	23.08
28	30B	CP30	10.00	4	4	0	2.88	0.	2.88	30.77
29	40B	CP40	10.00	5	5	0	3.60	0.	3.60	38.46
30	50B	CP50	10.00	0	0	0	0.	0.	0.	0.
31	60B	CP60	10.00	0	0	0	0.	0.	0.	0.
32	70B	CP70	10.00	0	0	0	0.	0.	0.	0.
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	0	0	0	0.	0.	0.	0.
36	10C	CP10	10.00	3	3	0	2.16	0.	2.16	37.50
37	20C	CP20	10.00	2	2	0	1.44	0.	1.44	25.00
38	30C	CP30	10.00	2	2	0	1.44	0.	1.44	25.00
39	40C	CP40	10.00	0	0	0	0.	0.	0.	0.
40	50C	CP50	10.00	0	0	0	0.	0.	0.	0.
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	1	1	0	.72	0.	.72	12.50
46	10D	CP10	10.00	1	1	0	.72	0.	.72	6.25
47	20D	CP20	10.00	0	0	0	0.	0.	0.	0.
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	15	15	0	10.79	0.	10.79	93.75
56	10E	CP10	10.00	3	3	0	2.16	0.	2.16	25.00
57	20E	CP20	10.00	2	2	0	1.44	0.	1.44	16.67
58	30E	CP30	10.00	3	3	0	2.16	0.	2.16	25.00
59	40E	CP40	10.00	2	2	0	1.44	0.	1.44	16.67
60	50E	CP50	10.00	2	2	0	1.44	0.	1.44	16.67
61	60E	CP60	10.00	0	0	0	0.	0.	0.	0.
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.
65	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-7. (Continued)

66	10F	CP10	10.00	1	1	0	.72	0.	.72	16.67
67	20F	CP20	10.00	1	1	0	.72	0.	.72	16.67
68	30F	CP30	10.00	0	0	0	0.	0.	0.	0.
69	40F	CP40	10.00	0	0	0	0.	0.	0.	0.
70	50F	CP50	10.00	2	2	0	1.44	0.	1.44	33.33
71	60F	CP60	10.00	0	0	0	0.	0.	0.	0.
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	2	2	0	1.44	0.	1.44	33.33
76	10G	CP10	10.00	1	1	0	.72	0.	.72	5.56
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	17	17	0	12.23	0.	12.23	94.44
86	10H	CP10	10.00	1	1	0	.72	0.	.72	16.67
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	5	5	0	3.60	0.	3.60	83.33
96	10I	CP10	10.00	0	0	0	0.	0.	0.	0.
97	20I	CP20	10.00	0	0	0	0.	0.	0.	0.
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	0	0	0	0.	0.	0.	0.
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	6	6	0	4.32	0.	4.32	100.00
116	10K	CP10	10.00	0	0	0	0.	0.	0.	0.
117	20K	CP20	10.00	0	0	0	0.	0.	0.	0.
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	1	1	0	.72	0.	.72	100.00
126	10L	CP10	10.00	0	0	0	0.	0.	0.	0.
127	20L	CP20	10.00	1	1	0	.72	0.	.72	100.00
128	30L	CP30	10.00	0	0	0	0.	0.	0.	0.
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	0	0	0	0.	0.	0.	0.
131	60L	CP60	10.00	0	0	0	0.	0.	0.	0.
132	70L	CP70	10.00	0	0	0	0.	0.	0.	0.
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-8. LOGIC TREE FOR ANALYZING DAMAGE CENTERLINE DISTANCE FROM STERN--HOLES

NODE NAME?				ALL						
NO.	NAME	EVENT	WEIGHT	--P--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVO	STEP	100.00	87	347	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	21	21	0	24.14	0.	24.14	24.14
3	PAB	PAB	7.14	20	20	0	22.99	0.	22.99	22.99
4	PAD	PAD	7.14	3	3	0	3.45	0.	3.45	3.45
5	PAE	PAE	7.14	12	12	0	13.79	0.	13.79	13.79
6	KSB	KSB	7.14	8	8	0	9.20	0.	9.20	9.20
7	KSD	KSD	7.14	6	6	0	6.90	0.	6.90	6.90
8	KES	KES	7.14	7	7	0	8.05	0.	8.05	8.05
9	KED	KED	7.14	3	3	0	3.45	0.	3.45	3.45
10	KEB	KEB	7.14	0	0	0	0.	0.	0.	0.
11	UPC	UPC	7.14	1	1	0	1.15	0.	1.15	1.15
12	LWC	LWC	7.14	3	3	0	3.45	0.	3.45	3.45
13	COM	COM	7.14	2	2	0	2.30	0.	2.30	2.30
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	1	1	0	1.15	0.	1.15	1.15
16	10A	CP10	10.00	6	6	0	6.90	0.	6.90	28.57
17	20A	CP20	10.00	9	9	0	10.34	0.	10.34	42.86
18	30A	CP30	10.00	3	3	0	3.45	0.	3.45	14.29
19	40A	CP40	10.00	3	3	0	3.45	0.	3.45	14.29
20	50A	CP50	10.00	0	0	0	0.	0.	0.	0.
21	60A	CP60	10.00	0	0	0	0.	0.	0.	0.
22	70A	CP70	10.00	0	0	0	0.	0.	0.	0.
23	99A	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	0	0	0	0.	0.	0.	0.
26	10B	CP10	10.00	6	6	0	6.90	0.	6.90	30.00
27	20B	CP20	10.00	4	4	0	4.60	0.	4.60	20.00
28	30B	CP30	10.00	2	2	0	2.30	0.	2.30	10.00
29	40B	CP40	10.00	4	4	0	4.60	0.	4.60	20.00
30	50B	CP50	10.00	3	3	0	3.45	0.	3.45	15.00
31	60B	CP60	10.00	0	0	0	0.	0.	0.	0.
32	70B	CP70	10.00	0	0	0	0.	0.	0.	0.
33	99B	CP99	10.00	0	0	0	0.	0.	0.	0.
34	????		10.00	0	0	0	0.	0.	0.	0.
35	$$$$		10.00	1	1	0	1.15	0.	1.15	5.00
36	10C	CP10	10.00	0	0	0	0.	0.	0.	0.
37	20C	CP20	10.00	1	1	0	1.15	0.	1.15	33.33
38	30C	CP30	10.00	1	1	0	1.15	0.	1.15	33.33
39	40C	CP40	10.00	1	1	0	1.15	0.	1.15	33.33
40	50C	CP50	10.00	0	0	0	0.	0.	0.	0.
41	60C	CP60	10.00	0	0	0	0.	0.	0.	0.
42	70C	CP70	10.00	0	0	0	0.	0.	0.	0.
43	99C	CP99	10.00	0	0	0	0.	0.	0.	0.
44	????		10.00	0	0	0	0.	0.	0.	0.
45	$$$$		10.00	0	0	0	0.	0.	0.	0.
46	10D	CP10	10.00	1	1	0	1.15	0.	1.15	8.33
47	20D	CP20	10.00	0	0	0	0.	0.	0.	0.
48	30D	CP30	10.00	0	0	0	0.	0.	0.	0.
49	40D	CP40	10.00	0	0	0	0.	0.	0.	0.
50	50D	CP50	10.00	0	0	0	0.	0.	0.	0.
51	60D	CP60	10.00	0	0	0	0.	0.	0.	0.
52	70D	CP70	10.00	0	0	0	0.	0.	0.	0.
53	99D	CP99	10.00	0	0	0	0.	0.	0.	0.
54	????		10.00	0	0	0	0.	0.	0.	0.
55	$$$$		10.00	11	11	0	12.64	0.	12.64	91.67
56	10E	CP10	10.00	2	2	0	2.30	0.	2.30	25.00
57	20E	CP20	10.00	2	2	0	2.30	0.	2.30	25.00
58	30E	CP30	10.00	2	2	0	2.30	0.	2.30	25.00
59	40E	CP40	10.00	2	2	0	2.30	0.	2.30	25.00
60	50E	CP50	10.00	0	0	0	0.	0.	0.	0.
61	60E	CP60	10.00	0	0	0	0.	0.	0.	0.
62	70E	CP70	10.00	0	0	0	0.	0.	0.	0.
63	99E	CP99	10.00	0	0	0	0.	0.	0.	0.
64	????		10.00	0	0	0	0.	0.	0.	0.
65	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-8. (Continued)

66	10F	CP10	10.00	1	1	0	1.15	0.	1.15	16.67
67	20F	CP20	10.00	3	3	0	3.45	0.	3.45	50.00
68	30F	CP30	10.00	0	0	0	0.	0.	0.	0.
69	40F	CP40	10.00	1	1	0	1.15	0.	1.15	16.67
70	50F	CP50	10.00	0	0	0	0.	0.	0.	0.
71	60F	CP60	10.00	0	0	0	0.	0.	0.	0.
72	70F	CP70	10.00	0	0	0	0.	0.	0.	0.
73	99F	CP99	10.00	0	0	0	0.	0.	0.	0.
74	????		10.00	0	0	0	0.	0.	0.	0.
75	$$$$		10.00	1	1	0	1.15	0.	1.15	16.67
76	10G	CP10	10.00	2	2	0	2.30	0.	2.30	28.57
77	20G	CP20	10.00	0	0	0	0.	0.	0.	0.
78	30G	CP30	10.00	0	0	0	0.	0.	0.	0.
79	40G	CP40	10.00	0	0	0	0.	0.	0.	0.
80	50G	CP50	10.00	0	0	0	0.	0.	0.	0.
81	60G	CP60	10.00	0	0	0	0.	0.	0.	0.
82	70G	CP70	10.00	0	0	0	0.	0.	0.	0.
83	99G	CP99	10.00	0	0	0	0.	0.	0.	0.
84	????		10.00	0	0	0	0.	0.	0.	0.
85	$$$$		10.00	5	5	0	5.75	0.	5.75	71.43
86	10H	CP10	10.00	1	1	0	1.15	0.	1.15	33.33
87	20H	CP20	10.00	0	0	0	0.	0.	0.	0.
88	30H	CP30	10.00	0	0	0	0.	0.	0.	0.
89	40H	CP40	10.00	0	0	0	0.	0.	0.	0.
90	50H	CP50	10.00	0	0	0	0.	0.	0.	0.
91	60H	CP60	10.00	0	0	0	0.	0.	0.	0.
92	70H	CP70	10.00	0	0	0	0.	0.	0.	0.
93	99H	CP99	10.00	0	0	0	0.	0.	0.	0.
94	????		10.00	0	0	0	0.	0.	0.	0.
95	$$$$		10.00	2	2	0	2.30	0.	2.30	66.67
96	10I	CP10	10.00	0	0	0	0.	0.	0.	0.
97	20I	CP20	10.00	0	0	0	0.	0.	0.	0.
98	30I	CP30	10.00	0	0	0	0.	0.	0.	0.
99	40I	CP40	10.00	0	0	0	0.	0.	0.	0.
100	50I	CP50	10.00	0	0	0	0.	0.	0.	0.
101	60I	CP60	10.00	0	0	0	0.	0.	0.	0.
102	70I	CP70	10.00	0	0	0	0.	0.	0.	0.
103	99I	CP99	10.00	0	0	0	0.	0.	0.	0.
104	????		10.00	0	0	0	0.	0.	0.	0.
105	$$$$		10.00	0	0	0	0.	0.	0.	0.
106	10J	CP10	10.00	0	0	0	0.	0.	0.	0.
107	20J	CP20	10.00	0	0	0	0.	0.	0.	0.
108	30J	CP30	10.00	0	0	0	0.	0.	0.	0.
109	40J	CP40	10.00	0	0	0	0.	0.	0.	0.
110	50J	CP50	10.00	0	0	0	0.	0.	0.	0.
111	60J	CP60	10.00	0	0	0	0.	0.	0.	0.
112	70J	CP70	10.00	0	0	0	0.	0.	0.	0.
113	99J	CP99	10.00	0	0	0	0.	0.	0.	0.
114	????		10.00	0	0	0	0.	0.	0.	0.
115	$$$$		10.00	1	1	0	1.15	0.	1.15	100.00
116	10K	CP10	10.00	2	2	0	2.30	0.	2.30	66.67
117	20K	CP20	10.00	0	0	0	0.	0.	0.	0.
118	30K	CP30	10.00	0	0	0	0.	0.	0.	0.
119	40K	CP40	10.00	0	0	0	0.	0.	0.	0.
120	50K	CP50	10.00	0	0	0	0.	0.	0.	0.
121	60K	CP60	10.00	0	0	0	0.	0.	0.	0.
122	70K	CP70	10.00	0	0	0	0.	0.	0.	0.
123	99K	CP99	10.00	0	0	0	0.	0.	0.	0.
124	????		10.00	0	0	0	0.	0.	0.	0.
125	$$$$		10.00	1	1	0	1.15	0.	1.15	33.33
126	10L	CP10	10.00	0	0	0	0.	0.	0.	0.
127	20L	CP20	10.00	0	0	0	0.	0.	0.	0.
128	30L	CP30	10.00	2	2	0	2.30	0.	2.30	100.00
129	40L	CP40	10.00	0	0	0	0.	0.	0.	0.
130	50L	CP50	10.00	0	0	0	0.	0.	0.	0.
131	60L	CP60	10.00	0	0	0	0.	0.	0.	0.
132	70L	CP70	10.00	0	0	0	0.	0.	0.	0.
133	99L	CP99	10.00	0	0	0	0.	0.	0.	0.
134	????		10.00	0	0	0	0.	0.	0.	0.
135	$$$$		10.00	0	0	0	0.	0.	0.	0.

EXHIBIT D-9. LOGIC TREE FOR ANALYZING FREQUENCY OF SIDE HULL RUPTURE IN LONGITUDINAL AND VERTICAL MATRIX

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVU	PAT	100.00	238	757	0	100.00	0.	100.00	100.00
2	BOW	BOW1	25.00	157	157	0	65.97	0.	65.97	65.97
3	STRN	STEP	25.00	69	69	0	28.99	0.	28.99	28.99
4	????		25.00	0	0	0	0.	0.	0.	0.
5	$$$$		25.00	12	12	0	5.04	0.	5.04	5.04
6	B10	CP10	10.00	57	57	0	23.95	0.	23.95	36.31
7	B20	CP20	10.00	28	28	0	11.76	0.	11.76	17.83
8	B30	CP30	10.00	28	28	0	11.76	0.	11.76	17.83
9	B40	CP40	10.00	12	12	0	5.04	0.	5.04	7.64
10	B50	CP50	10.00	15	15	0	6.30	0.	6.30	9.55
11	B60	CP60	10.00	8	8	0	3.36	0.	3.36	5.10
12	B70	CP70	10.00	2	2	0	.84	0.	.84	1.27
13	B99	CP99	10.00	1	1	0	.42	0.	.42	.64
14	????		10.00	0	0	0	0.	0.	0.	0.
15	$$$$		10.00	6	6	0	2.52	0.	2.52	3.82
16	S10	CP10	10.00	24	24	0	10.08	0.	10.08	34.78
17	S20	CP20	10.00	17	17	0	7.14	0.	7.14	24.64
18	S30	CP30	10.00	9	9	0	3.78	0.	3.78	13.04
19	S40	CP40	10.00	7	7	0	2.94	0.	2.94	10.14
20	S50	CP50	10.00	2	2	0	.84	0.	.84	2.90
21	S60	CP60	10.00	1	1	0	.42	0.	.42	1.45
22	S70	CP70	10.00	1	1	0	.42	0.	.42	1.45
23	S99	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	8	8	0	3.36	0.	3.36	11.59
26	25A	V25	14.29	7	7	0	2.94	0.	2.94	12.28
27	50A	V50	14.29	15	15	0	6.30	0.	6.30	26.32
28	75A	V75	14.29	11	11	0	4.62	0.	4.62	19.30
29	100A	V100	14.29	13	13	0	5.46	0.	5.46	22.81
30	500A	V500	14.29	8	8	0	3.36	0.	3.36	14.04
31	????		14.29	0	0	0	0.	0.	0.	0.
32	$$$$		14.29	3	3	0	1.26	0.	1.26	5.26
33	25B	V25	14.29	6	6	0	2.52	0.	2.52	21.43
34	50B	V50	14.29	6	6	0	2.52	0.	2.52	21.43
35	75B	V75	14.29	4	4	0	1.68	0.	1.68	14.29
36	100B	V100	14.29	4	4	0	1.68	0.	1.68	14.29
37	500B	V500	14.29	8	8	0	3.36	0.	3.36	28.57
38	????		14.29	0	0	0	0.	0.	0.	0.
39	$$$$		14.29	0	0	0	0.	0.	0.	0.
40	25C	V25	14.29	2	2	0	.84	0.	.84	7.14
41	50C	V50	14.29	6	6	0	2.52	0.	2.52	21.43
42	75C	V75	14.29	6	6	0	2.52	0.	2.52	21.43
43	100C	V100	14.29	7	7	0	2.94	0.	2.94	25.00
44	500C	V500	14.29	7	7	0	2.94	0.	2.94	25.00
45	????		14.29	0	0	0	0.	0.	0.	0.
46	$$$$		14.29	0	0	0	0.	0.	0.	0.
47	25D	V25	14.29	2	2	0	.84	0.	.84	16.67
48	50D	V50	14.29	2	2	0	.84	0.	.84	16.67
49	75D	V75	14.29	3	3	0	1.26	0.	1.26	25.00
50	100D	V100	14.29	2	2	0	.84	0.	.84	16.67
51	500D	V500	14.29	3	3	0	1.26	0.	1.26	25.00
52	????		14.29	0	0	0	0.	0.	0.	0.
53	$$$$		14.29	0	0	0	0.	0.	0.	0.
54	[illegible]									
55	50E	V50	14.29	4	4	0	1.68	0.	1.68	26.67
56	75E	V75	14.29	1	1	0	.42	0.	.42	6.67
57	100E	V100	14.29	4	4	0	1.68	0.	1.68	26.67
58	500E	V500	14.29	6	6	0	2.52	0.	2.52	40.00
59	????		14.29	0	0	0	0.	0.	0.	0.
60	$$$$		14.29	0	0	0	0.	0.	0.	0.
61	25F	V25	14.29	0	0	0	0.	0.	0.	0.
62	50F	V50	14.29	3	3	0	1.26	0.	1.26	37.50
63	75F	V75	14.29	2	2	0	.84	0.	.84	25.00
64	100F	V100	14.29	2	2	0	.84	0.	.84	25.00
65	500F	V500	14.29	0	0	0	0.	0.	0.	0.
66	????		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-9. (Continued)

67	$$$$		14.29	1	1	0	.42	0.	.42	12.50
68	25G	V25	14.29	0	0	0	0.	0.	0.	0.
69	50G	V50	14.29	0	0	0	0.	0.	0.	0.
70	75G	V75	14.29	0	0	0	0.	0.	0.	0.
71	100G	V100	14.29	1	1	0	.42	0.	.42	50.00
72	500G	V500	14.29	1	1	0	.42	0.	.42	50.00
73	????		14.29	0	0	0	0.	0.	0.	0.
74	$$$$		14.29	0	0	0	0.	0.	0.	0.
75	25H	V25	14.29	0	0	0	0.	0.	0.	0.
76	50H	V50	14.29	0	0	0	0.	0.	0.	0.
77	75H	V75	14.29	0	0	0	0.	0.	0.	0.
78	100H	V100	14.29	1	1	0	.42	0.	.42	100.00
79	500H	V500	14.29	0	0	0	0.	0.	0.	0.
80	????		14.29	0	0	0	0.	0.	0.	0.
81	$$$$		14.29	0	0	0	0.	0.	0.	0.
82	25I	V25	14.29	3	3	0	1.26	0.	1.26	12.50
83	50I	V50	14.29	7	7	0	2.94	0.	2.94	29.17
84	75I	V75	14.29	7	7	0	2.94	0.	2.94	29.17
85	100I	V100	14.29	2	2	0	.84	0.	.84	8.33
86	500I	V500	14.29	5	5	0	2.10	0.	2.10	20.83
87	????		14.29	0	0	0	0.	0.	0.	0.
88	$$$$		14.29	0	0	0	0.	0.	0.	0.
89	25J	V25	14.29	2	2	0	.84	0.	.84	11.76
90	50J	V50	14.29	2	2	0	.84	0.	.84	11.76
91	75J	V75	14.29	5	5	0	2.10	0.	2.10	29.41
92	100J	V100	14.29	6	6	0	2.52	0.	2.52	35.29
93	500J	V500	14.29	2	2	0	.84	0.	.84	11.76
94	????		14.29	0	0	0	0.	0.	0.	0.
95	$$$$		14.29	0	0	0	0.	0.	0.	0.
96	25K	V25	14.29	0	0	0	0.	0.	0.	0.
97	50K	V50	14.29	3	3	0	1.26	0.	1.26	33.33
98	75K	V75	14.29	2	2	0	.84	0.	.84	22.22
99	100K	V100	14.29	1	1	0	.42	0.	.42	11.11
100	500K	V500	14.29	3	3	0	1.26	0.	1.26	33.33
101	????		14.29	0	0	0	0.	0.	0.	0.
102	$$$$		14.29	0	0	0	0.	0.	0.	0.
103	25L	V25	14.29	2	2	0	.84	0.	.84	28.57
104	50L	V50	14.29	2	2	0	.84	0.	.84	28.57
105	75L	V75	14.29	1	1	0	.42	0.	.42	14.29
106	100L	V100	14.29	0	0	0	0.	0.	0.	0.
107	500L	V500	14.29	2	2	0	.84	0.	.84	28.57
108	????		14.29	0	0	0	0.	0.	0.	0.
109	$$$$		14.29	0	0	0	0.	0.	0.	0.
110	25M	V25	14.29	1	1	0	.42	0.	.42	50.00
111	50M	V50	14.29	0	0	0	0.	0.	0.	0.
112	75M	V75	14.29	0	0	0	0.	0.	0.	0.
113	100M	V100	14.29	0	0	0	0.	0.	0.	0.
114	500M	V500	14.29	1	1	0	.42	0.	.42	50.00
115	????		14.29	0	0	0	0.	0.	0.	0.
116	$$$$		14.29	0	0	0	0.	0.	0.	0.
117	25N	V25	14.29	0	0	0	0.	0.	0.	0.
118	50N	V50	14.29	0	0	0	0.	0.	0.	0.
119	75N	V75	14.29	0	0	0	0.	0.	0.	0.
120	100N	V100	14.29	0	0	0	0.	0.	0.	0.
121	500N	V500	14.29	1	1	0	.42	0.	.42	100.00
122	????		14.29	0	0	0	0.	0.	0.	0.
123	$$$$		14.29	0	0	0	0.	0.	0.	0.
124	25O	V25	14.29	0	0	0	0.	0.	0.	0.
125	50O	V50	14.29	0	0	0	0.	0.	0.	0.
126	75O	V75	14.29	0	0	0	0.	0.	0.	0.
127	100O	V100	14.29	0	0	0	0.	0.	0.	0.
128	500O	V500	14.29	1	1	0	.42	0.	.42	100.00
129	????		14.29	0	0	0	0.	0.	0.	0.
130	$$$$		14.29	0	0	0	0.	0.	0.	0.
131	25P	V25	14.29	0	0	0	0.	0.	0.	0.
132	50P	V50	14.29	0	0	0	0.	0.	0.	0.
133	75P	V75	14.29	0	0	0	0.	0.	0.	0.
134	100P	V100	14.29	0	0	0	0.	0.	0.	0.
135	500P	V500	14.29	0	0	0	0.	0.	0.	0.
136	????		14.29	0	0	0	0.	0.	0.	0.
137	$$$$		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-10. LOGIC TREE FOR ANALYZING FREQUENCY OF SIDE CRACKS IN LONGITUDINAL AND VERTICAL MATRIX

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --P--	--C--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEVO	PAS	100.00	159	436	0	100.00	0.	100.00	100.00
2	BDW	BDW1	25.00	101	101	0	63.52	0.	63.52	63.52
3	STRN	STER	25.00	51	51	0	32.08	0.	32.08	32.08
4	????		25.00	0	0	0	0.	0.	0.	0.
5	$$$$		25.00	7	7	0	4.40	0.	4.40	4.40
6	B10	CP10	10.00	35	35	0	22.01	0.	22.01	34.65
7	B20	CP20	10.00	20	20	0	12.58	0.	12.58	19.80
8	B30	CP30	10.00	15	15	0	9.43	0.	9.43	14.85
9	B40	CP40	10.00	8	8	0	5.03	0.	5.03	7.92
10	B50	CP50	10.00	9	9	0	5.66	0.	5.66	8.91
11	B60	CP60	10.00	7	7	0	4.40	0.	4.40	6.93
12	B70	CP70	10.00	1	1	0	.63	0.	.63	.99
13	B99	CP99	10.00	1	1	0	.63	0.	.63	.99
14	????		10.00	0	0	0	0.	0.	0.	0.
15	$$$$		10.00	5	5	0	3.14	0.	3.14	4.95
16	S10	CP10	10.00	19	19	0	11.95	0.	11.95	37.25
17	S20	CP20	10.00	9	9	0	5.66	0.	5.66	17.65
18	S30	CP30	10.00	6	6	0	3.77	0.	3.77	11.76
19	S40	CP40	10.00	5	5	0	3.14	0.	3.14	9.80
20	S50	CP50	10.00	2	2	0	1.26	0.	1.26	3.92
21	S60	CP60	10.00	1	1	0	.63	0.	.63	1.96
22	S70	CP70	10.00	1	1	0	.63	0.	.63	1.96
23	S99	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	8	8	0	5.03	0.	5.03	15.69
26	25A	V25	14.29	3	3	0	1.89	0.	1.89	8.57
27	50A	V50	14.29	9	9	0	5.66	0.	5.66	25.71
28	75A	V75	14.29	6	6	0	3.77	0.	3.77	17.14
29	100A	V100	14.29	9	9	0	5.66	0.	5.66	25.71
30	500A	V500	14.29	6	6	0	3.77	0.	3.77	17.14
31	????		14.29	0	0	0	0.	0.	0.	0.
32	$$$$		14.29	2	2	0	1.26	0.	1.26	5.71
33	25B	V25	14.29	4	4	0	2.52	0.	2.52	20.00
34	50B	V50	14.29	3	3	0	1.89	0.	1.89	15.00
35	75B	V75	14.29	3	3	0	1.89	0.	1.89	15.00
36	100B	V100	14.29	2	2	0	1.26	0.	1.26	10.00
37	500B	V500	14.29	8	8	0	5.03	0.	5.03	40.00
38	????		14.29	0	0	0	0.	0.	0.	0.
39	$$$$		14.29	0	0	0	0.	0.	0.	0.
40	25C	V25	14.29	2	2	0	1.26	0.	1.26	13.33
41	50C	V50	14.29	3	3	0	1.89	0.	1.89	20.00
42	75C	V75	14.29	3	3	0	1.89	0.	1.89	20.00
43	100C	V100	14.29	3	3	0	1.89	0.	1.89	20.00
44	500C	V500	14.29	4	4	0	2.52	0.	2.52	26.67
45	????		14.29	0	0	0	0.	0.	0.	0.
46	$$$$		14.29	0	0	0	0.	0.	0.	0.
47	25D	V25	14.29	1	1	0	.63	0.	.63	12.50
48	50D	V50	14.29	1	1	0	.63	0.	.63	12.50
49	75D	V75	14.29	2	2	0	1.26	0.	1.26	25.00
50	100D	V100	14.29	2	2	0	1.26	0.	1.26	25.00
51	500D	V500	14.29	2	2	0	1.26	0.	1.26	25.00
52	????		14.29	0	0	0	0.	0.	0.	0.
53	$$$$		14.29	0	0	0	0.	0.	0.	0.
54	25E	V25	14.29	0	0	0	0.	0.	0.	0.
55	50E	V50	14.29	0	0	0	0.	0.	0.	0.
56	75E	V75	14.29	0	0	0	0.	0.	0.	0.
57	100E	V100	14.29	3	3	0	1.89	0.	1.89	33.33
58	500E	V500	14.29	6	6	0	3.77	0.	3.77	66.67
59	????		14.29	0	0	0	0.	0.	0.	0.
60	$$$$		14.29	0	0	0	0.	0.	0.	0.
61	25F	V25	14.29	0	0	0	0.	0.	0.	0.
62	50F	V50	14.29	2	2	0	1.26	0.	1.26	28.57
63	75F	V75	14.29	2	2	0	1.26	0.	1.26	28.57
64	100F	V100	14.29	2	2	0	1.26	0.	1.26	28.57
65	500F	V500	14.29	0	0	0	0.	0.	0.	0.
66	????		14.29	0	0	0	0.	0.	0.	0.
67	$$$$		14.29	1	1	0	.63	0.	.63	14.29

EXHIBIT D-10. (Continued)

68	25G	V25	14.29	0	0	0	0.	0.	0.	0.
69	50G	V50	14.29	0	0	0	0.	0.	0.	0.
70	75G	V75	14.29	0	0	0	0.	0.	0.	0.
71	100G	V100	14.29	0	0	0	0.	0.	0.	0.
72	500G	V500	14.29	1	1	0	.63	0.	.63	100.00
73	????		14.29	0	0	0	0.	0.	0.	0.
74	$$$$		14.29	0	0	0	0.	0.	0.	0.
75	25H	V25	14.29	0	0	0	0.	0.	0.	0.
76	50H	V50	14.29	0	0	0	0.	0.	0.	0.
77	75H	V75	14.29	0	0	0	0.	0.	0.	0.
78	100H	V100	14.29	1	1	0	.63	0.	.63	100.00
79	500H	V500	14.29	0	0	0	0.	0.	0.	0.
80	????		14.29	0	0	0	0.	0.	0.	0.
81	$$$$		14.29	0	0	0	0.	0.	0.	0.
82	25I	V25	14.29	3	3	0	1.89	0.	1.89	15.79
83	50I	V50	14.29	4	4	0	2.52	0.	2.52	21.05
84	75I	V75	14.29	5	5	0	3.14	0.	3.14	26.32
85	100I	V100	14.29	2	2	0	1.26	0.	1.26	10.53
86	500I	V500	14.29	5	5	0	3.14	0.	3.14	26.32
87	????		14.29	0	0	0	0.	0.	0.	0.
88	$$$$		14.29	0	0	0	0.	0.	0.	0.
89	25J	V25	14.29	1	1	0	.63	0.	.63	11.11
90	50J	V50	14.29	0	0	0	0.	0.	0.	0.
91	75J	V75	14.29	4	4	0	2.52	0.	2.52	44.44
92	100J	V100	14.29	3	3	0	1.89	0.	1.89	33.33
93	500J	V500	14.29	1	1	0	.63	0.	.63	11.11
94	????		14.29	0	0	0	0.	0.	0.	0.
95	$$$$		14.29	0	0	0	0.	0.	0.	0.
96	25K	V25	14.29	0	0	0	0.	0.	0.	0.
97	50K	V50	14.29	2	2	0	1.26	0.	1.26	33.33
98	75K	V75	14.29	2	2	0	1.26	0.	1.26	33.33
99	100K	V100	14.29	1	1	0	.63	0.	.63	16.67
100	500K	V500	14.29	1	1	0	.63	0.	.63	16.67
101	????		14.29	0	0	0	0.	0.	0.	0.
102	$$$$		14.29	0	0	0	0.	0.	0.	0.
103	25L	V25	14.29	1	1	0	.63	0.	.63	20.00
104	50L	V50	14.29	2	2	0	1.26	0.	1.26	40.00
105	75L	V75	14.29	0	0	0	0.	0.	0.	0.
106	100L	V100	14.29	0	0	0	0.	0.	0.	0.
107	500L	V500	14.29	2	2	0	1.26	0.	1.26	40.00
108	????		14.29	0	0	0	0.	0.	0.	0.
109	$$$$		14.29	0	0	0	0.	0.	0.	0.
110	25M	V25	14.29	1	1	0	.63	0.	.63	50.00
111	50M	V50	14.29	0	0	0	0.	0.	0.	0.
112	75M	V75	14.29	0	0	0	0.	0.	0.	0.
113	100M	V100	14.29	0	0	0	0.	0.	0.	0.
114	500M	V500	14.29	1	1	0	.63	0.	.63	50.00
115	????		14.29	0	0	0	0.	0.	0.	0.
116	$$$$		14.29	0	0	0	0.	0.	0.	0.
117	25N	V25	14.29	0	0	0	0.	0.	0.	0.
118	50N	V50	14.29	0	0	0	0.	0.	0.	0.
119	75N	V75	14.29	0	0	0	0.	0.	0.	0.
120	100N	V100	14.29	0	0	0	0.	0.	0.	0.
121	500N	V500	14.29	1	1	0	.63	0.	.63	100.00
122	????		14.29	0	0	0	0.	0.	0.	0.
123	$$$$		14.29	0	0	0	0.	0.	0.	0.
124	25O	V25	14.29	0	0	0	0.	0.	0.	0.
125	50O	V50	14.29	0	0	0	0.	0.	0.	0.
126	75O	V75	14.29	0	0	0	0.	0.	0.	0.
127	100O	V100	14.29	0	0	0	0.	0.	0.	0.
128	500O	V500	14.29	1	1	0	.63	0.	.63	100.00
129	????		14.29	0	0	0	0.	0.	0.	0.
130	$$$$		14.29	0	0	0	0.	0.	0.	0.
131	25P	V25	14.29	0	0	0	0.	0.	0.	0.
132	50P	V50	14.29	0	0	0	0.	0.	0.	0.
133	75P	V75	14.29	0	0	0	0.	0.	0.	0.
134	100P	V100	14.29	0	0	0	0.	0.	0.	0.
135	500P	V500	14.29	0	0	0	0.	0.	0.	0.
136	????		14.29	0	0	0	0.	0.	0.	0.
137	$$$$		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-11. LOGIC TREE FOR ANALYZING FREQUENCY OF SIDE HOLES IN LONGITUDINAL AND VERTICAL MATRIX

NODE NO.	NAME? NAME	EVENT	WEIGHT	ALL --P--	--F--	-N/O-	--S1--	--S2--	--PT--	--PP--
1	LEV0	PAS	100.00	88	347	0	100.00	0.	100.00	100.00
2	BOW	BOW1	25.00	62	62	0	70.45	0.	70.45	70.45
3	STRN	STEP	25.00	21	21	0	23.86	0.	23.86	23.86
4	????		25.00	0	0	0	0.	0.	0.	0.
5	$$$$		25.00	5	5	0	5.68	0.	5.68	5.68
6	B10	CP10	10.00	24	24	0	27.27	0.	27.27	38.71
7	B20	CP20	10.00	8	8	0	9.09	0.	9.09	12.90
8	B30	CP30	10.00	13	13	0	14.77	0.	14.77	20.97
9	B40	CP40	10.00	6	6	0	6.82	0.	6.82	9.68
10	B50	CP50	10.00	4	4	0	4.55	0.	4.55	6.45
11	B60	CP60	10.00	3	3	0	3.41	0.	3.41	4.84
12	B70	CP70	10.00	2	2	0	2.27	0.	2.27	3.23
13	B99	CP99	10.00	0	0	0	0.	0.	0.	0.
14	????		10.00	0	0	0	0.	0.	0.	0.
15	$$$$		10.00	2	2	0	2.27	0.	2.27	3.23
16	S10	CP10	10.00	6	6	0	6.82	0.	6.82	28.57
17	S20	CP20	10.00	9	9	0	10.23	0.	10.23	42.86
18	S30	CP30	10.00	3	3	0	3.41	0.	3.41	14.29
19	S40	CP40	10.00	3	3	0	3.41	0.	3.41	14.29
20	S50	CP50	10.00	0	0	0	0.	0.	0.	0.
21	S60	CP60	10.00	0	0	0	0.	0.	0.	0.
22	S70	CP70	10.00	0	0	0	0.	0.	0.	0.
23	S99	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	0	0	0	0.	0.	0.	0.
26	25A	V25	14.29	4	4	0	4.55	0.	4.55	16.67
27	50A	V50	14.29	5	5	0	5.68	0.	5.68	20.83
28	75A	V75	14.29	5	5	0	5.68	0.	5.68	20.83
29	100A	V100	14.29	5	5	0	5.68	0.	5.68	20.83
30	500A	V500	14.29	3	3	0	3.41	0.	3.41	12.50
31	????		14.29	0	0	0	0.	0.	0.	0.
32	$$$$		14.29	2	2	0	2.27	0.	2.27	8.33
33	25B	V25	14.29	2	2	0	2.27	0.	2.27	25.00
34	50B	V50	14.29	3	3	0	3.41	0.	3.41	37.50
35	75B	V75	14.29	1	1	0	1.14	0.	1.14	12.50
36	100B	V100	14.29	2	2	0	2.27	0.	2.27	25.00
37	500B	V500	14.29	0	0	0	0.	0.	0.	0.
38	????		14.29	0	0	0	0.	0.	0.	0.
39	$$$$		14.29	0	0	0	0.	0.	0.	0.
40	25C	V25	14.29	0	0	0	0.	0.	0.	0.
41	50C	V50	14.29	3	3	0	3.41	0.	3.41	23.08
42	75C	V75	14.29	3	3	0	3.41	0.	3.41	23.08
43	100C	V100	14.29	4	4	0	4.55	0.	4.55	30.77
44	500C	V500	14.29	3	3	0	3.41	0.	3.41	23.08
45	????		14.29	0	0	0	0.	0.	0.	0.
46	$$$$		14.29	0	0	0	0.	0.	0.	0.
47	25D	V25	14.29	1	1	0	1.14	0.	1.14	16.67
48	50D	V50	14.29	1	1	0	1.14	0.	1.14	16.67
49	75D	V75	14.29	2	2	0	2.27	0.	2.27	33.33
50	100D	V100	14.29	0	0	0	0.	0.	0.	0.
51	500D	V500	14.29	2	2	0	2.27	0.	2.27	33.33
52	????		14.29	0	0	0	0.	0.	0.	0.
53	$$$$		14.29	0	0	0	0.	0.	0.	0.
54	25E	V25	14.29	0	0	0	0.	0.	0.	0.
55	50E	V50	14.29	2	2	0	2.27	0.	2.27	50.00
56	75E	V75	14.29	1	1	0	1.14	0.	1.14	25.00
57	100E	V100	14.29	1	1	0	1.14	0.	1.14	25.00
58	500E	V500	14.29	0	0	0	0.	0.	0.	0.
59	????		14.29	0	0	0	0.	0.	0.	0.
60	$$$$		14.29	0	0	0	0.	0.	0.	0.
61	25F	V25	14.29	0	0	0	0.	0.	0.	0.
62	50F	V50	14.29	1	1	0	1.14	0.	1.14	33.33
63	75F	V75	14.29	0	0	0	0.	0.	0.	0.
64	100F	V100	14.29	1	1	0	1.14	0.	1.14	33.33
65	500F	V500	14.29	0	0	0	0.	0.	0.	0.
66	????		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-11. (Continued)

67	$$$$		14.29	1	1	0	1.14	0.	1.14	33.33
68	25G	V25	14.29	0	0	0	0.	0.	0.	0.
69	50G	V50	14.29	0	0	0	0.	0.	0.	0.
70	75G	V75	14.29	0	0	0	0.	0.	0.	0.
71	100G	V100	14.29	1	1	0	1.14	0.	1.14	50.00
72	500G	V500	14.29	1	1	0	1.14	0.	1.14	50.00
73	????		14.29	0	0	0	0.	0.	0.	0.
74	$$$$		14.29	0	0	0	0.	0.	0.	0.
75	25H	V25	14.29	0	0	0	0.	0.	0.	0.
76	50H	V50	14.29	0	0	0	0.	0.	0.	0.
77	75H	V75	14.29	0	0	0	0.	0.	0.	0.
78	100H	V100	14.29	0	0	0	0.	0.	0.	0.
79	500H	V500	14.29	0	0	0	0.	0.	0.	0.
80	????		14.29	0	0	0	0.	0.	0.	0.
81	$$$$		14.29	0	0	0	0.	0.	0.	0.
82	25I	V25	14.29	0	0	0	0.	0.	0.	0.
83	50I	V50	14.29	3	3	0	3.41	0.	3.41	50.00
84	75I	V75	14.29	2	2	0	2.27	0.	2.27	33.33
85	100I	V100	14.29	0	0	0	0.	0.	0.	0.
86	500I	V500	14.29	1	1	0	1.14	0.	1.14	16.67
87	????		14.29	0	0	0	0.	0.	0.	0.
88	$$$$		14.29	0	0	0	0.	0.	0.	0.
89	25J	V25	14.29	2	2	0	2.27	0.	2.27	22.22
90	50J	V50	14.29	2	2	0	2.27	0.	2.27	22.22
91	75J	V75	14.29	1	1	0	1.14	0.	1.14	11.11
92	100J	V100	14.29	3	3	0	3.41	0.	3.41	33.33
93	500J	V500	14.29	1	1	0	1.14	0.	1.14	11.11
94	????		14.29	0	0	0	0.	0.	0.	0.
95	$$$$		14.29	0	0	0	0.	0.	0.	0.
96	25K	V25	14.29	0	0	0	0.	0.	0.	0.
97	50K	V50	14.29	1	1	0	1.14	0.	1.14	33.33
98	75K	V75	14.29	0	0	0	0.	0.	0.	0.
99	100K	V100	14.29	0	0	0	0.	0.	0.	0.
100	500K	V500	14.29	2	2	0	2.27	0.	2.27	66.67
101	????		14.29	0	0	0	0.	0.	0.	0.
102	$$$$		14.29	0	0	0	0.	0.	0.	0.
103	25L	V25	14.29	1	1	0	1.14	0.	1.14	33.33
104	50L	V50	14.29	1	1	0	1.14	0.	1.14	33.33
105	75L	V75	14.29	1	1	0	1.14	0.	1.14	33.33
106	100L	V100	14.29	0	0	0	0.	0.	0.	0.
107	500L	V500	14.29	0	0	0	0.	0.	0.	0.
108	????		14.29	0	0	0	0.	0.	0.	0.
109	$$$$		14.29	0	0	0	0.	0.	0.	0.
110	25M	V25	14.29	0	0	0	0.	0.	0.	0.
111	50M	V50	14.29	0	0	0	0.	0.	0.	0.
112	75M	V75	14.29	0	0	0	0.	0.	0.	0.
113	100M	V100	14.29	0	0	0	0.	0.	0.	0.
114	500M	V500	14.29	0	0	0	0.	0.	0.	0.
115	????		14.29	0	0	0	0.	0.	0.	0.
116	$$$$		14.29	0	0	0	0.	0.	0.	0.
117	25N	V25	14.29	0	0	0	0.	0.	0.	0.
118	50N	V50	14.29	0	0	0	0.	0.	0.	0.
119	75N	V75	14.29	0	0	0	0.	0.	0.	0.
120	100N	V100	14.29	0	0	0	0.	0.	0.	0.
121	500N	V500	14.29	0	0	0	0.	0.	0.	0.
122	????		14.29	0	0	0	0.	0.	0.	0.
123	$$$$		14.29	0	0	0	0.	0.	0.	0.
124	25O	V25	14.29	0	0	0	0.	0.	0.	0.
125	50O	V50	14.29	0	0	0	0.	0.	0.	0.
126	75O	V75	14.29	0	0	0	0.	0.	0.	0.
127	100O	V100	14.29	0	0	0	0.	0.	0.	0.
128	500O	V500	14.29	0	0	0	0.	0.	0.	0.
129	????		14.29	0	0	0	0.	0.	0.	0.
130	$$$$		14.29	0	0	0	0.	0.	0.	0.
131	25P	V25	14.29	0	0	0	0.	0.	0.	0.
132	50P	V50	14.29	0	0	0	0.	0.	0.	0.
133	75P	V75	14.29	0	0	0	0.	0.	0.	0.
134	100P	V100	14.29	0	0	0	0.	0.	0.	0.
135	500P	V500	14.29	0	0	0	0.	0.	0.	0.
136	????		14.29	0	0	0	0.	0.	0.	0.
137	$$$$		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-12. LOGIC TREE FOR ANALYZING FREQUENCY OF SIDE WASTED THROUGH DAMAGE IN LONGITUDINAL AND VERTICAL MATRIX

NODE NO.	NAME	EVENT	ALL WEIGHT	--R--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEVO	PAS	100.00	5	22	0	10.00	0.	100.00	100.00
2	BOW	BOW1	25.00	4	4	0	80.00	0.	80.00	80.00
3	STRN	STER	25.00	0	0	0	0.	0.	0.	0.
4	????		25.00	0	0	0	0.	0.	0.	0.
5	$$$$		25.00	1	1	0	20.00	0.	20.00	20.00
6	B10	CP10	10.00	2	2	0	40.00	0.	40.00	50.00
7	B20	CP20	10.00	0	0	0	0.	0.	0.	0.
8	B30	CP30	10.00	0	0	0	0.	0.	0.	0.
9	B40	CP40	10.00	0	0	0	0.	0.	0.	0.
10	B50	CP50	10.00	2	2	0	40.00	0.	40.00	50.00
11	B60	CP60	10.00	0	0	0	0.	0.	0.	0.
12	B70	CP70	10.00	0	0	0	0.	0.	0.	0.
13	B99	CP99	10.00	0	0	0	0.	0.	0.	0.
14	????		10.00	0	0	0	0.	0.	0.	0.
15	$$$$		10.00	0	0	0	0.	0.	0.	0.
16	S10	CP10	10.00	0	0	0	0.	0.	0.	0.
17	S20	CP20	10.00	0	0	0	0.	0.	0.	0.
18	S30	CP30	10.00	0	0	0	0.	0.	0.	0.
19	S40	CP40	10.00	0	0	0	0.	0.	0.	0.
20	S50	CP50	10.00	0	0	0	0.	0.	0.	0.
21	S60	CP60	10.00	0	0	0	0.	0.	0.	0.
22	S70	CP70	10.00	0	0	0	0.	0.	0.	0.
23	S99	CP99	10.00	0	0	0	0.	0.	0.	0.
24	????		10.00	0	0	0	0.	0.	0.	0.
25	$$$$		10.00	0	0	0	0.	0.	0.	0.
26	25A	V25	14.29	0	0	0	0.	0.	0.	0.
27	50A	V50	14.29	1	1	0	20.00	0.	20.00	50.00
28	75A	V75	14.29	1	1	0	20.00	0.	20.00	50.00
29	100A	V100	14.29	0	0	0	0.	0.	0.	0.
30	500A	V500	14.29	0	0	0	0.	0.	0.	0.
31	????		14.29	0	0	0	0.	0.	0.	0.
32	$$$$		14.29	0	0	0	0.	0.	0.	0.
33	25B	V25	14.29	0	0	0	0.	0.	0.	0.
34	50B	V50	14.29	0	0	0	0.	0.	0.	0.
35	75B	V75	14.29	0	0	0	0.	0.	0.	0.
36	100B	V100	14.29	0	0	0	0.	0.	0.	0.
37	500B	V500	14.29	0	0	0	0.	0.	0.	0.
38	????		14.29	0	0	0	0.	0.	0.	0.
39	$$$$		14.29	0	0	0	0.	0.	0.	0.
40	25C	V25	14.29	0	0	0	0.	0.	0.	0.
41	50C	V50	14.29	0	0	0	0.	0.	0.	0.
42	75C	V75	14.29	0	0	0	0.	0.	0.	0.
43	100C	V100	14.29	0	0	0	0.	0.	0.	0.
44	500C	V500	14.29	0	0	0	0.	0.	0.	0.
45	????		14.29	0	0	0	0.	0.	0.	0.
46	$$$$		14.29	0	0	0	0.	0.	0.	0.
47	25D	V25	14.29	0	0	0	0.	0.	0.	0.
48	50D	V50	14.29	0	0	0	0.	0.	0.	0.
49	75D	V75	14.29	0	0	0	0.	0.	0.	0.
50	100D	V100	14.29	0	0	0	0.	0.	0.	0.
51	500D	V500	14.29	0	0	0	0.	0.	0.	0.
52	????		14.29	0	0	0	0.	0.	0.	0.
53	$$$$		14.29	0	0	0	0.	0.	0.	0.
54	25E	V25	14.29	0	0	0	0.	0.	0.	0.
55	50E	V50	14.29	2	2	0	40.00	0.	40.00	100.00
56	75E	V75	14.29	0	0	0	0.	0.	0.	0.
57	100E	V100	14.29	0	0	0	0.	0.	0.	0.
58	500E	V500	14.29	0	0	0	0.	0.	0.	0.
59	????		14.29	0	0	0	0.	0.	0.	0.
60	$$$$		14.29	0	0	0	0.	0.	0.	0.
61	25F	V25	14.29	0	0	0	0.	0.	0.	0.
62	50F	V50	14.29	0	0	0	0.	0.	0.	0.
63	75F	V75	14.29	0	0	0	0.	0.	0.	0.
64	100F	V100	14.29	0	0	0	0.	0.	0.	0.
65	500F	V500	14.29	0	0	0	0.	0.	0.	0.
66	????		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-12. (Continued)

67	$$$$		14.29	0	0	0	0.	0.	0.	0.
68	25G	V25	14.29	0	0	0	0.	0.	0.	0.
69	50G	V50	14.29	0	0	0	0.	0.	0.	0.
70	75G	V75	14.29	0	0	0	0.	0.	0.	0.
71	100G	V100	14.29	0	0	0	0.	0.	0.	0.
72	500G	V500	14.29	0	0	0	0.	0.	0.	0.
73	????		14.29	0	0	0	0.	0.	0.	0.
74	$$$$		14.29	0	0	0	0.	0.	0.	0.
75	25H	V25	14.29	0	0	0	0.	0.	0.	0.
76	50H	V50	14.29	0	0	0	0.	0.	0.	0.
77	75H	V75	14.29	0	0	0	0.	0.	0.	0.
78	100H	V100	14.29	0	0	0	0.	0.	0.	0.
79	500H	V500	14.29	0	0	0	0.	0.	0.	0.
80	????		14.29	0	0	0	0.	0.	0.	0.
81	$$$$		14.29	0	0	0	0.	0.	0.	0.
82	25I	V25	14.29	0	0	0	0.	0.	0.	0.
83	50I	V50	14.29	0	0	0	0.	0.	0.	0.
84	75I	V75	14.29	0	0	0	0.	0.	0.	0.
85	100I	V100	14.29	0	0	0	0.	0.	0.	0.
86	500I	V500	14.29	0	0	0	0.	0.	0.	0.
87	????		14.29	0	0	0	0.	0.	0.	0.
88	$$$$		14.29	0	0	0	0.	0.	0.	0.
89	25J	V25	14.29	0	0	0	0.	0.	0.	0.
90	50J	V50	14.29	0	0	0	0.	0.	0.	0.
91	75J	V75	14.29	0	0	0	0.	0.	0.	0.
92	100J	V100	14.29	0	0	0	0.	0.	0.	0.
93	500J	V500	14.29	0	0	0	0.	0.	0.	0.
94	????		14.29	0	0	0	0.	0.	0.	0.
95	$$$$		14.29	0	0	0	0.	0.	0.	0.
96	25K	V25	14.29	0	0	0	0.	0.	0.	0.
97	50K	V50	14.29	0	0	0	0.	0.	0.	0.
98	75K	V75	14.29	0	0	0	0.	0.	0.	0.
99	100K	V100	14.29	0	0	0	0.	0.	0.	0.
100	500K	V500	14.29	0	0	0	0.	0.	0.	0.
101	????		14.29	0	0	0	0.	0.	0.	0.
102	$$$$		14.29	0	0	0	0.	0.	0.	0.
103	25L	V25	14.29	0	0	0	0.	0.	0.	0.
104	50L	V50	14.29	0	0	0	0.	0.	0.	0.
105	75L	V75	14.29	0	0	0	0.	0.	0.	0.
106	100L	V100	14.29	0	0	0	0.	0.	0.	0.
107	500L	V500	14.29	0	0	0	0.	0.	0.	0.
108	????		14.29	0	0	0	0.	0.	0.	0.
109	$$$$		14.29	0	0	0	0.	0.	0.	0.
110	25M	V25	14.29	0	0	0	0.	0.	0.	0.
111	50M	V50	14.29	0	0	0	0.	0.	0.	0.
112	75M	V75	14.29	0	0	0	0.	0.	0.	0.
113	100M	V100	14.29	0	0	0	0.	0.	0.	0.
114	500M	V500	14.29	0	0	0	0.	0.	0.	0.
115	????		14.29	0	0	0	0.	0.	0.	0.
116	$$$$		14.29	0	0	0	0.	0.	0.	0.
117	25N	V25	14.29	0	0	0	0.	0.	0.	0.
118	50N	V50	14.29	0	0	0	0.	0.	0.	0.
119	75N	V75	14.29	0	0	0	0.	0.	0.	0.
120	100N	V100	14.29	0	0	0	0.	0.	0.	0.
121	500N	V500	14.29	0	0	0	0.	0.	0.	0.
122	????		14.29	0	0	0	0.	0.	0.	0.
123	$$$$		14.29	0	0	0	0.	0.	0.	0.
124	25O	V25	14.29	0	0	0	0.	0.	0.	0.
125	50O	V50	14.29	0	0	0	0.	0.	0.	0.
126	75O	V75	14.29	0	0	0	0.	0.	0.	0.
127	100O	V100	14.29	0	0	0	0.	0.	0.	0.
128	500O	V500	14.29	0	0	0	0.	0.	0.	0.
129	????		14.29	0	0	0	0.	0.	0.	0.
130	$$$$		14.29	0	0	0	0.	0.	0.	0.
131	25P	V25	14.29	0	0	0	0.	0.	0.	0.
132	50P	V50	14.29	0	0	0	0.	0.	0.	0.
133	75P	V75	14.29	0	0	0	0.	0.	0.	0.
134	100P	V100	14.29	0	0	0	0.	0.	0.	0.
135	500P	V500	14.29	0	0	0	0.	0.	0.	0.
136	????		14.29	0	0	0	0.	0.	0.	0.
137	$$$$		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-13. LOGIC TREE FOR ANALYZING CRACK LENGTH

NODE NO.	NAME	EVENT NAME	WEIGHT	ALL --F--	--C--	-N/D-	--S1--	--S2--	--PT--	--PP--
1	LEV0	CRAK	100.00	436	1289	0	100.00	0.	100.00	100.00
2	PAS	PAS	7.14	159	159	0	36.47	0.	36.47	36.47
3	PAB	PAB	7.14	57	57	0	13.07	0.	13.07	13.07
4	PAD	PAD	7.14	17	17	0	3.90	0.	3.90	3.90
5	PAE	PAE	7.14	49	49	0	11.24	0.	11.24	11.24
6	KSB	KSB	7.14	37	37	0	8.49	0.	8.49	8.49
7	KSD	KSD	7.14	30	30	0	6.88	0.	6.88	6.88
8	KES	KES	7.14	33	33	0	7.57	0.	7.57	7.57
9	KED	KED	7.14	22	22	0	5.05	0.	5.05	5.05
10	KEB	KEB	7.14	7	7	0	1.61	0.	1.61	1.61
11	UPC	UPC	7.14	9	9	0	2.06	0.	2.06	2.06
12	LWC	LWC	7.14	7	7	0	1.61	0.	1.61	1.61
13	COM	COM	7.14	5	5	0	1.15	0.	1.15	1.15
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	4	4	0	.92	0.	.92	.92
16	L1A	LLT1	14.29	70	70	0	16.06	0.	16.06	44.03
17	L3A	LLT3	14.29	15	15	0	3.44	0.	3.44	9.43
18	L6A	LLT6	14.29	7	7	0	1.61	0.	1.61	4.40
19	L10A	LL10	14.29	5	5	0	1.15	0.	1.15	3.14
20	L11A	LG10	14.29	10	10	0	2.29	0.	2.29	6.29
21	????		14.29	0	0	0	0.	0.	0.	0.
22	$$$$		14.29	52	52	0	11.93	0.	11.93	32.70
23	L1B	LLT1	14.29	18	18	0	4.13	0.	4.13	31.58
24	L3B	LLT3	14.29	2	2	0	.46	0.	.46	3.51
25	L6B	LLT6	14.29	0	0	0	0.	0.	0.	0.
26	L10B	LL10	14.29	0	0	0	0.	0.	0.	0.
27	L11B	LG10	14.29	9	9	0	2.06	0.	2.06	15.79
28	????		14.29	0	0	0	0.	0.	0.	0.
29	$$$$		14.29	28	28	0	6.42	0.	6.42	49.12
30	L1C	LLT1	14.29	3	3	0	.69	0.	.69	17.65
31	L3C	LLT3	14.29	1	1	0	.23	0.	.23	5.88
32	L6C	LLT6	14.29	1	1	0	.23	0.	.23	5.88
33	L10C	LL10	14.29	0	0	0	0.	0.	0.	0.
34	L11C	LG10	14.29	2	2	0	.46	0.	.46	11.76
35	????		14.29	0	0	0	0.	0.	0.	0.
36	$$$$		14.29	10	10	0	2.29	0.	2.29	58.82
37	L1D	LLT1	14.29	15	15	0	3.44	0.	3.44	30.61
38	L3D	LLT3	14.29	12	12	0	2.75	0.	2.75	24.49
39	L6D	LLT6	14.29	7	7	0	1.61	0.	1.61	14.29
40	L10D	LL10	14.29	2	2	0	.46	0.	.46	4.08
41	L11D	LG10	14.29	4	4	0	.92	0.	.92	8.16
42	????		14.29	0	0	0	0.	0.	0.	0.
43	$$$$		14.29	9	9	0	2.06	0.	2.06	18.37
44	L1E	LLT1	14.29	5	5	0	1.15	0.	1.15	13.51
45	L3E	LLT3	14.29	8	8	0	1.83	0.	1.83	21.62
46	L6E	LLT6	14.29	2	2	0	.46	0.	.46	5.41
47	L10E	LL10	14.29	1	1	0	.23	0.	.23	2.70
48	L11E	LG10	14.29	9	9	0	2.06	0.	2.06	24.32
49	????		14.29	0	0	0	0.	0.	0.	0.
50	$$$$		14.29	12	12	0	2.75	0.	2.75	32.43
51	L1F	LLT1	14.29	3	3	0	.69	0.	.69	10.00
52	L3F	LLT3	14.29	3	3	0	.69	0.	.69	10.00
53	L6F	LLT6	14.29	2	2	0	.46	0.	.46	6.67
54	L10F	LL10	14.29	3	3	0	.69	0.	.69	10.00
55	L11F	LG10	14.29	3	3	0	.69	0.	.69	10.00
56	????		14.29	0	0	0	0.	0.	0.	0.
57	$$$$		14.29	16	16	0	3.67	0.	3.67	53.33
58	L1G	LLT1	14.29	12	12	0	2.75	0.	2.75	36.36
59	L3G	LLT3	14.29	3	3	0	.69	0.	.69	9.09
60	L6G	LLT6	14.29	1	1	0	.23	0.	.23	3.03
61	L10G	LL10	14.29	4	4	0	.92	0.	.92	12.12
62	L11G	LG10	14.29	0	0	0	0.	0.	0.	0.
63	????		14.29	0	0	0	0.	0.	0.	0.

EXHIBIT D-13. (Continued)

64	$$$$		14.29	13	13	0	2.98	0.	2.98	39.39
65	L1H	LLT1	14.29	7	7	0	1.61	0.	1.61	31.82
66	L3H	LLT3	14.29	3	3	0	.69	0.	.69	13.64
67	L6H	LLT6	14.29	4	4	0	.92	0.	.92	18.18
68	L10H	LL10	14.29	1	1	0	.23	0.	.23	4.55
69	L11H	LG10	14.29	2	2	0	.46	0.	.46	9.09
70	????		14.29	0	0	0	0.	0.	0.	0.
71	$$$$		14.29	5	5	0	1.15	0.	1.15	22.73
72	L1I	LLT1	14.29	0	0	0	0.	0.	0.	0.
73	L3I	LLT3	14.29	1	1	0	.23	0.	.23	14.29
74	L6I	LLT6	14.29	0	0	0	0.	0.	0.	0.
75	L10I	LL10	14.29	1	1	0	.23	0.	.23	14.29
76	L11I	LG10	14.29	0	0	0	0.	0.	0.	0.
77	????		14.29	0	0	0	0.	0.	0.	0.
78	$$$$		14.29	5	5	0	1.15	0.	1.15	71.43
79	L1J	LLT1	14.29	3	3	0	.69	0.	.69	33.33
80	L3J	LLT3	14.29	0	0	0	0.	0.	0.	0.
81	L6J	LLT6	14.29	1	1	0	.23	0.	.23	11.11
82	L10J	LL10	14.29	0	0	0	0.	0.	0.	0.
83	L11J	LG10	14.29	1	1	0	.23	0.	.23	11.11
84	????		14.29	0	0	0	0.	0.	0.	0.
85	$$$$		14.29	4	4	0	.92	0.	.92	44.44
86	L1K	LLT1	14.29	1	1	0	.23	0.	.23	14.29
87	L3K	LLT3	14.29	0	0	0	0.	0.	0.	0.
88	L6K	LLT6	14.29	1	1	0	.23	0.	.23	14.29
89	L10K	LL10	14.29	0	0	0	0.	0.	0.	0.
90	L11K	LG10	14.29	1	1	0	.23	0.	.23	14.29
91	????		14.29	0	0	0	0.	0.	0.	0.
92	$$$$		14.29	4	4	0	.92	0.	.92	57.14
93	L1L	LLT1	14.29	0	0	0	0.	0.	0.	0.
94	L3L	LLT3	14.29	0	0	0	0.	0.	0.	0.
95	L6L	LLT6	14.29	1	1	0	.23	0.	.23	20.00
96	L10L	LL10	14.29	0	0	0	0.	0.	0.	0.
97	L11L	LG10	14.29	1	1	0	.23	0.	.23	20.00
98	????		14.29	0	0	0	0.	0.	0.	0.
99	$$$$		14.29	3	3	0	.69	0.	.69	60.00

EXHIBIT D-14. LOGIC TREE FOR ANALYZING AREA OF HOLED DAMAGE

NODE NAME			ALL							
NO.	NAME	EVENT	WEIGHT	--P--	--C--	-N/D-	--P1--	--P2--	--PT--	--PP--
1	LEV0	HOLE	100.00	347	1289	0	100.00	0.	100.00	100.00
2	PAE	PAE	7.14	88	88	0	25.36	0.	25.36	25.36
3	PAB	PAB	7.14	74	74	0	21.33	0.	21.33	21.33
4	PAD	PAD	7.14	11	11	0	3.17	0.	3.17	3.17
5	PAE	PAE	7.14	42	42	0	12.10	0.	12.10	12.10
6	KSB	KSB	7.14	37	37	0	10.66	0.	10.66	10.66
7	KSD	KSD	7.14	16	16	0	4.61	0.	4.61	4.61
8	KES	KES	7.14	19	19	0	5.48	0.	5.48	5.48
9	KED	KED	7.14	17	17	0	4.90	0.	4.90	4.90
10	KED	KED	7.14	20	20	0	5.76	0.	5.76	5.76
11	[illegible]	[illegible]	7.14	2	2	0	.58	0.	.58	.58
12	[illegible]	[illegible]	7.14	13	13	0	3.75	0.	3.75	3.75
13	[illegible]	[illegible]	7.14	5	5	0	1.44	0.	1.44	1.44
14	[illegible]		7.14	0	0	0	0.	0.	0.	0.
15	[illegible]		7.14	3	3	0	.86	0.	.86	.86
16	ARLA	L100	33.33	74	74	0	21.33	0.	21.33	84.09
17	????		33.33	0	0	0	0.	0.	0.	0.
18	$$$$		33.33	14	14	0	4.03	0.	4.03	15.91
19	ARLB	L100	33.33	58	58	0	16.71	0.	16.71	78.38
20	????		33.33	0	0	0	0.	0.	0.	0.
21	$$$$		33.33	16	16	0	4.61	0.	4.61	21.62
22	ARLC	L100	33.33	10	10	0	2.88	0.	2.88	90.91
23	????		33.33	0	0	0	0.	0.	0.	0.
24	$$$$		33.33	1	1	0	.29	0.	.29	9.09
25	ARLD	L100	33.33	39	39	0	11.24	0.	11.24	92.86
26	????		33.33	0	0	0	0.	0.	0.	0.
27	$$$$		33.33	3	3	0	.86	0.	.86	7.14
28	ARLE	L100	33.33	25	25	0	7.20	0.	7.20	67.57
29	????		33.33	0	0	0	0.	0.	0.	0.
30	$$$$		33.33	12	12	0	3.46	0.	3.46	32.43
31	ARLF	L100	33.33	4	4	0	1.15	0.	1.15	25.00
32	????		33.33	0	0	0	0.	0.	0.	0.
33	$$$$		33.33	12	12	0	3.46	0.	3.46	75.00
34	ARLG	L100	33.33	12	12	0	3.46	0.	3.46	63.16
35	????		33.33	0	0	0	0.	0.	0.	0.
36	$$$$		33.33	7	7	0	2.02	0.	2.02	36.84
37	ARLH	L100	33.33	9	9	0	2.59	0.	2.59	52.94
38	????		33.33	0	0	0	0.	0.	0.	0.
39	$$$$		33.33	8	8	0	2.31	0.	2.31	47.06
40	ARLI	L100	33.33	12	12	0	3.46	0.	3.46	60.00
41	????		33.33	0	0	0	0.	0.	0.	0.
42	$$$$		33.33	8	8	0	2.31	0.	2.31	40.00
43	ARLJ	L100	33.33	2	2	0	.58	0.	.58	100.00
44	????		33.33	0	0	0	0.	0.	0.	0.
45	$$$$		33.33	0	0	0	0.	0.	0.	0.
46	ARLK	L100	33.33	3	3	0	.86	0.	.86	23.08
47	????		33.33	0	0	0	0.	0.	0.	0.
48	$$$$		33.33	10	10	0	2.88	0.	2.88	76.92
49	ARLL	L100	33.33	0	0	0	0.	0.	0.	0.
50	????		33.33	0	0	0	0.	0.	0.	0.
51	$$$$		33.33	5	5	0	1.44	0.	1.44	100.00
52	A1A	ALT1	12.50	32	32	0	9.22	0.	9.22	43.24
53	A2A	ALT2	12.50	5	5	0	1.44	0.	1.44	6.76
54	A3A	ALT3	12.50	3	3	0	.86	0.	.86	4.05
55	A5A	ALT5	12.50	0	0	0	0.	0.	0.	0.
56	A10A	AL10	12.50	9	9	0	2.59	0.	2.59	12.16
57	A11A	A610	12.50	23	23	0	6.63	0.	6.63	31.08
58	????		12.50	0	0	0	0.	0.	0.	0.
59	$$$$		12.50	2	2	0	.58	0.	.58	2.70
60	A1B	ALT1	12.50	31	31	0	8.93	0.	8.93	53.45
61	A2B	ALT2	12.50	2	2	0	.58	0.	.58	3.45
62	A3B	ALT3	12.50	0	0	0	0.	0.	0.	0.
63	A5B	ALT5	12.50	4	4	0	1.15	0.	1.15	6.90
64	A10B	AL10	12.50	4	4	0	1.15	0.	1.15	6.90
65	A11B	A610	12.50	15	15	0	4.32	0.	4.32	25.86
66	????		12.50	0	0	0	0.	0.	0.	0.
67	$$$$		12.50	2	2	0	.58	0.	.58	3.45
68	A1C	ALT1	12.50	3	3	0	.86	0.	.86	30.00
69	A2C	ALT2	12.50	0	0	0	0.	0.	0.	0.
70	A3C	ALT3	12.50	1	1	0	.29	0.	.29	10.00
71	A5C	ALT5	12.50	0	0	0	0.	0.	0.	0.
72	A10C	AL10	12.50	1	1	0	.29	0.	.29	10.00
73	A11C	A610	12.50	5	5	0	1.44	0.	1.44	50.00
74	????		12.50	0	0	0	0.	0.	0.	0.
75	$$$$		12.50	0	0	0	0.	0.	0.	0.

EXHIBIT D-14. (Continued)

76	A1D	ALT1	12.50	18	18	0	5.19	0.	5.19	46.15
77	A2D	ALT2	12.50	1	1	0	.29	0.	.29	2.56
78	A3D	ALT3	12.50	1	1	0	.29	0.	.29	2.56
79	A5D	ALT5	12.50	5	5	0	1.44	0.	1.44	12.82
80	A10D	AL10	12.50	5	5	0	1.44	0.	1.44	12.82
81	A11D	AG10	12.50	9	9	0	2.59	0.	2.59	23.08
82	????		12.50	0	0	0	0.	0.	0.	0.
83	$$$$		12.50	0	0	0	0.	0.	0.	0.
84	A1E	ALT1	12.50	6	6	0	1.73	0.	1.73	24.00
85	A2E	ALT2	12.50	1	1	0	.29	0.	.29	4.00
86	A3E	ALT3	12.50	2	2	0	.58	0.	.58	8.00
87	A5E	ALT5	12.50	4	4	0	1.15	0.	1.15	16.00
88	A10E	AL10	12.50	5	5	0	1.44	0.	1.44	20.00
89	A11E	AG10	12.50	7	7	0	2.02	0.	2.02	28.00
90	????		12.50	0	0	0	0.	0.	0.	0.
91	$$$$		12.50	0	0	0	0.	0.	0.	0.
92	A1F	ALT1	12.50	0	0	0	0.	0.	0.	0.
93	A2F	ALT2	12.50	0	0	0	0.	0.	0.	0.
94	A3F	ALT3	12.50	0	0	0	0.	0.	0.	0.
95	A5F	ALT5	12.50	0	0	0	0.	0.	0.	0.
96	A10F	AL10	12.50	1	1	0	.29	0.	.29	25.00
97	A11F	AG10	12.50	3	3	0	.86	0.	.86	75.00
98	????		12.50	0	0	0	0.	0.	0.	0.
99	$$$$		12.50	0	0	0	0.	0.	0.	0.
100	A1G	ALT1	12.50	2	2	0	.58	0.	.58	16.67
101	A2G	ALT2	12.50	0	0	0	0.	0.	0.	0.
102	A3G	ALT3	12.50	0	0	0	0.	0.	0.	0.
103	A5G	ALT5	12.50	3	3	0	.86	0.	.86	25.00
104	A10G	AL10	12.50	2	2	0	.58	0.	.58	16.67
105	A11G	AG10	12.50	4	4	0	1.15	0.	1.15	33.33
106	????		12.50	0	0	0	0.	0.	0.	0.
107	$$$$		12.50	1	1	0	.29	0.	.29	8.33
108	A1H	ALT1	12.50	2	2	0	.58	0.	.58	22.22
109	A2H	ALT2	12.50	0	0	0	0.	0.	0.	0.
110	A3H	ALT3	12.50	0	0	0	0.	0.	0.	0.
111	A5H	ALT5	12.50	0	0	0	0.	0.	0.	0.
112	A10H	AL10	12.50	2	2	0	.58	0.	.58	22.22
113	A11H	AG10	12.50	5	5	0	1.44	0.	1.44	55.56
114	????		12.50	0	0	0	0.	0.	0.	0.
115	$$$$		12.50	0	0	0	0.	0.	0.	0.
116	A1I	ALT1	12.50	3	3	0	.86	0.	.86	25.00
117	A2I	ALT2	12.50	1	1	0	.29	0.	.29	8.33
118	A3I	ALT3	12.50	1	1	0	.29	0.	.29	8.33
119	A5I	ALT5	12.50	0	0	0	0.	0.	0.	0.
120	A10I	AL10	12.50	1	1	0	.29	0.	.29	8.33
121	A11I	AG10	12.50	4	4	0	1.15	0.	1.15	33.33
122	????		12.50	0	0	0	0.	0.	0.	0.
123	$$$$		12.50	2	2	0	.58	0.	.58	16.67
124	A1J	ALT1	12.50	0	0	0	0.	0.	0.	0.
125	A2J	ALT2	12.50	0	0	0	0.	0.	0.	0.
126	A3J	ALT3	12.50	0	0	0	0.	0.	0.	0.
127	A5J	ALT5	12.50	0	0	0	0.	0.	0.	0.
128	A10J	AL10	12.50	0	0	0	0.	0.	0.	0.
129	A11J	AG10	12.50	2	2	0	.58	0.	.58	100.00
130	????		12.50	0	0	0	0.	0.	0.	0.
131	$$$$		12.50	0	0	0	0.	0.	0.	0.
132	A1K	ALT1	12.50	1	1	0	.29	0.	.29	33.33
133	A2K	ALT2	12.50	0	0	0	0.	0.	0.	0.
134	A3K	ALT3	12.50	0	0	0	0.	0.	0.	0.
135	A5K	ALT5	12.50	0	0	0	0.	0.	0.	0.
136	A10K	AL10	12.50	1	1	0	.29	0.	.29	33.33
137	A11K	AG10	12.50	1	1	0	.29	0.	.29	33.33
138	????		12.50	0	0	0	0.	0.	0.	0.
139	$$$$		12.50	0	0	0	0.	0.	0.	0.
140	A1L	ALT1	12.50	0	0	0	0.	0.	0.	0.
141	A2L	ALT2	12.50	0	0	0	0.	0.	0.	0.
142	A3L	ALT3	12.50	0	0	0	0.	0.	0.	0.
143	A5L	ALT5	12.50	0	0	0	0.	0.	0.	0.
144	A10L	AL10	12.50	0	0	0	0.	0.	0.	0.
145	A11L	AG10	12.50	0	0	0	0.	0.	0.	0.
146	????		12.50	0	0	0	0.	0.	0.	0.
147	$$$$		12.50	0	0	0	0.	0.	0.	0.

EXHIBIT D-15. LOGIC TREE FOR ANALYZING AREA OF WASTED THROUGH DAMAGE

NODE	NODE	EVENT	WEIGHT	ALL			--S1--	--S2--	--PT--	--PP--
NO.	NAME			--P--	--C--	-N D-				
1	LEVO	MODL	100.00	22	1000	0	100.00	0.	100.00	100.00
2	PAS	PAC	7.14	5	5	0	22.73	0.	22.73	22.73
3	PAB	PAB	7.14	9	9	0	40.91	0.	40.91	40.91
4	PAD	PAD	7.14	0	0	0	0.	0.	0.	0.
5	PAE	PAE	7.14	2	2	0	9.09	0.	9.09	9.09
6	MSB	MSB	7.14	1	1	0	4.55	0.	4.55	4.55
7	MSD	MSD	7.14	2	2	0	9.09	0.	9.09	9.09
8	MES	MES	7.14	0	0	0	0.	0.	0.	0.
9	MED	MED	7.14	0	0	0	0.	0.	0.	0.
10	MEB	MEB	7.14	1	1	0	4.55	0.	4.55	4.55
11	UPC	UPC	7.14	0	0	0	0.	0.	0.	0.
12	LMC	LMC	7.14	1	1	0	4.55	0.	4.55	4.55
13	COM	COM	7.14	1	1	0	4.55	0.	4.55	4.55
14	????		7.14	0	0	0	0.	0.	0.	0.
15	$$$$		7.14	0	0	0	0.	0.	0.	0.
16	AFLA	L100	33.33	4	4	0	18.18	0.	18.18	80.00
17	????		33.33	0	0	0	0.	0.	0.	0.
18	$$$$		33.33	1	1	0	4.55	0.	4.55	20.00
19	AFLB	L100	33.33	8	8	0	36.36	0.	36.36	88.89
20	????		33.33	0	0	0	0.	0.	0.	0.
21	$$$$		33.33	1	1	0	4.55	0.	4.55	11.11
22	AFLC	L100	33.33	0	0	0	0.	0.	0.	0.
23	????		33.33	0	0	0	0.	0.	0.	0.
24	$$$$		33.33	0	0	0	0.	0.	0.	0.
25	AFLD	L100	33.33	2	2	0	9.09	0.	9.09	100.00
26	????		33.33	0	0	0	0.	0.	0.	0.
27	$$$$		33.33	0	0	0	0.	0.	0.	0.
28	AFLE	L100	33.33	1	1	0	4.55	0.	4.55	100.00
29	????		33.33	0	0	0	0.	0.	0.	0.
30	$$$$		33.33	0	0	0	0.	0.	0.	0.
31	AFLF	L100	33.33	2	2	0	9.09	0.	9.09	100.00
32	????		33.33	0	0	0	0.	0.	0.	0.
33	$$$$		33.33	0	0	0	0.	0.	0.	0.
34	AFLG	L100	33.33	0	0	0	0.	0.	0.	0.
35	????		33.33	0	0	0	0.	0.	0.	0.
36	$$$$		33.33	0	0	0	0.	0.	0.	0.
37	AFLH	L100	33.33	0	0	0	0.	0.	0.	0.
38	????		33.33	0	0	0	0.	0.	0.	0.
39	$$$$		33.33	0	0	0	0.	0.	0.	0.
40	AFLI	L100	33.33	0	0	0	0.	0.	0.	0.
41	????		33.33	0	0	0	0.	0.	0.	0.
42	$$$$		33.33	1	1	0	4.55	0.	4.55	100.00
43	AFLJ	L100	33.33	0	0	0	0.	0.	0.	0.
44	????		33.33	0	0	0	0.	0.	0.	0.
45	$$$$		33.33	0	0	0	0.	0.	0.	0.
46	AFLK	L100	33.33	1	1	0	4.55	0.	4.55	100.00
47	????		33.33	0	0	0	0.	0.	0.	0.
48	$$$$		33.33	0	0	0	0.	0.	0.	0.
49	AFLL	L100	33.33	0	0	0	0.	0.	0.	0.
50	????		33.33	0	0	0	0.	0.	0.	0.
51	$$$$		33.33	1	1	0	4.55	0.	4.55	100.00
52	A1A	ALT1	12.50	0	0	0	0.	0.	0.	0.
53	A2A	ALT2	12.50	0	0	0	0.	0.	0.	0.
54	A3A	ALT3	12.50	0	0	0	0.	0.	0.	0.
55	A5A	ALT5	12.50	1	1	0	4.55	0.	4.55	25.00
56	A10A	AL10	12.50	0	0	0	0.	0.	0.	0.
57	A11A	AG10	12.50	3	3	0	13.64	0.	13.64	75.00
58	????		12.50	0	0	0	0.	0.	0.	0.
59	$$$$		12.50	0	0	0	0.	0.	0.	0.
60	A1B	ALT1	12.50	4	4	0	18.18	0.	18.18	50.00
61	A2B	ALT2	12.50	0	0	0	0.	0.	0.	0.
62	A3B	ALT3	12.50	0	0	0	0.	0.	0.	0.
63	A5B	ALT5	12.50	1	1	0	4.55	0.	4.55	12.50
64	A10B	AL10	12.50	1	1	0	4.55	0.	4.55	12.50
65	A11B	AG10	12.50	2	2	0	9.09	0.	9.09	25.00
66	????		12.50	0	0	0	0.	0.	0.	0.
67	$$$$		12.50	0	0	0	0.	0.	0.	0.
68	A1C	ALT1	12.50	0	0	0	0.	0.	0.	0.
69	A2C	ALT2	12.50	0	0	0	0.	0.	0.	0.
70	A3C	ALT3	12.50	0	0	0	0.	0.	0.	0.
71	A5C	ALT5	12.50	0	0	0	0.	0.	0.	0.
72	A10C	AL10	12.50	0	0	0	0.	0.	0.	0.
73	A11C	AG10	12.50	0	0	0	0.	0.	0.	0.
74	????		12.50	0	0	0	0.	0.	0.	0.
75	$$$$		12.50	0	0	0	0.	0.	0.	0.

EXHIBIT D-15. (Continued)

76	A1D	ALT1	12.50	1	1	0	4.55	0.	4.55	50.00
77	A2D	ALT2	12.50	0	0	0	0.	0.	0.	0.
78	A3D	ALT3	12.50	0	0	0	0.	0.	0.	0.
79	A5D	ALT5	12.50	0	0	0	0.	0.	0.	0.
80	A10D	ALL0	12.50	0	0	0	0.	0.	0.	0.
81	A11D	AG10	12.50	1	1	0	4.55	0.	4.55	50.00
82	????		12.50	0	0	0	0.	0.	0.	0.
83	$$$$		12.50	0	0	0	0.	0.	0.	0.
84	A1E	ALT1	12.50	0	0	0	0.	0.	0.	0.
85	A2E	ALT2	12.50	0	0	0	0.	0.	0.	0.
86	A3E	ALT3	12.50	0	0	0	0.	0.	0.	0.
87	A5E	ALT5	12.50	0	0	0	0.	0.	0.	0.
88	A10E	AL10	12.50	0	0	0	0.	0.	0.	0.
89	A11E	AG10	12.50	1	1	0	4.55	0.	4.55	100.00
90	????		12.50	0	0	0	0.	0.	0.	0.
91	$$$$		12.50	0	0	0	0.	0.	0.	0.
92	A1F	ALT1	12.50	0	0	0	0.	0.	0.	0.
93	A2F	ALT2	12.50	0	0	0	0.	0.	0.	0.
94	A3F	ALT3	12.50	0	0	0	0.	0.	0.	0.
95	A5F	ALT5	12.50	0	0	0	0.	0.	0.	0.
96	A10F	AL10	12.50	0	0	0	0.	0.	0.	0.
97	A11F	AG10	12.50	2	2	0	9.09	0.	9.09	100.00
98	????		12.50	0	0	0	0.	0.	0.	0.
99	$$$$		12.50	0	0	0	0.	0.	0.	0.
100	A1G	ALT1	12.50	0	0	0	0.	0.	0.	0.
101	A2G	ALT2	12.50	0	0	0	0.	0.	0.	0.
102	A3G	ALT3	12.50	0	0	0	0.	0.	0.	0.
103	A5G	ALT5	12.50	0	0	0	0.	0.	0.	0.
104	A10G	AL10	12.50	0	0	0	0.	0.	0.	0.
105	A11G	AG10	12.50	0	0	0	0.	0.	0.	0.
106	????		12.50	0	0	0	0.	0.	0.	0.
107	$$$$		12.50	0	0	0	0.	0.	0.	0.
108	A1H	ALT1	12.50	0	0	0	0.	0.	0.	0.
109	A2H	ALT2	12.50	0	0	0	0.	0.	0.	0.
110	A3H	ALT3	12.50	0	0	0	0.	0.	0.	0.
...	...	...	...	0	0	0	0.	0.	0.	0.
112	A10H	AL10	12.50	0	0	0	0.	0.	0.	0.
113	A11H	AG10	12.50	0	0	0	0.	0.	0.	0.
114	????		12.50	0	0	0	0.	0.	0.	0.
115	$$$$		12.50	0	0	0	0.	0.	0.	0.
116	A1I	ALT1	12.50	0	0	0	0.	0.	0.	0.
117	A2I	ALT2	12.50	0	0	0	0.	0.	0.	0.
118	A3I	ALT3	12.50	0	0	0	0.	0.	0.	0.
119	A5I	ALT5	12.50	0	0	0	0.	0.	0.	0.
120	A10I	AL10	12.50	0	0	0	0.	0.	0.	0.
121	A11I	AG10	12.50	0	0	0	0.	0.	0.	0.
122	????		12.50	0	0	0	0.	0.	0.	0.
123	$$$$		12.50	0	0	0	0.	0.	0.	0.
124	A1J	ALT1	12.50	0	0	0	0.	0.	0.	0.
125	A2J	ALT2	12.50	0	0	0	0.	0.	0.	0.
126	A3J	ALT3	12.50	0	0	0	0.	0.	0.	0.
127	A5J	ALT5	12.50	0	0	0	0.	0.	0.	0.
128	A10J	AL10	12.50	0	0	0	0.	0.	0.	0.
129	A11J	AG10	12.50	0	0	0	0.	0.	0.	0.
130	????		12.50	0	0	0	0.	0.	0.	0.
131	$$$$		12.50	0	0	0	0.	0.	0.	0.
132	A1K	ALT1	12.50	0	0	0	0.	0.	0.	0.
133	A2K	ALT2	12.50	0	0	0	0.	0.	0.	0.
134	A3K	ALT3	12.50	0	0	0	0.	0.	0.	0.
135	A5K	ALT5	12.50	0	0	0	0.	0.	0.	0.
136	A10K	AL10	12.50	0	0	0	0.	0.	0.	0.
137	A11K	AG10	12.50	1	1	0	4.55	0.	4.55	100.00
138	????		12.50	0	0	0	0.	0.	0.	0.
139	$$$$		12.50	0	0	0	0.	0.	0.	0.
140	A1L	ALT1	12.50	0	0	0	0.	0.	0.	0.
141	A2L	ALT2	12.50	0	0	0	0.	0.	0.	0.
142	A3L	ALT3	12.50	0	0	0	0.	0.	0.	0.
143	A5L	ALT5	12.50	0	0	0	0.	0.	0.	0.
144	A10L	AL10	12.50	0	0	0	0.	0.	0.	0.
145	A11L	AG10	12.50	0	0	0	0.	0.	0.	0.
146	????		12.50	0	0	0	0.	0.	0.	0.
147	$$$$		12.50	0	0	0	0.	0.	0.	0.