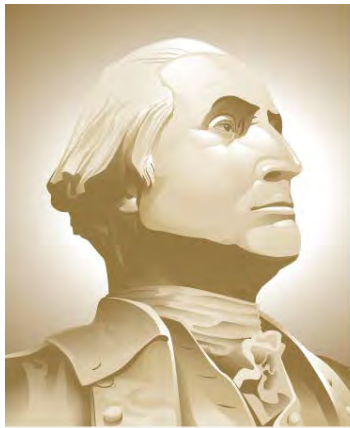


VTRA 2010 POTENTIAL COLLISION FREQUENCY BY ALL FV, CARGO – FV and TANK- FV

Presentation by: J. Rene van Dorp



THE GEORGE
WASHINGTON
UNIVERSITY

WASHINGTON, DC

VCU

2010 BASE CASE

GWU Personnel: Dr. J. Rene van Dorp

VCU Personnel: Dr. Jason R. W. Merrick

AUGUST 20, 2013

PRELIMINARY

Table. Focus Vessel (FV) Classification for the 26 VTOSS vessel type classification used in the GW/VCU MTS simulation model.

NON – FV : Those vessels that are only considered as Interacting Vessels (IV) with Focus Vessels (FV) in this study

CARGO – FV : Bulk Carriers, Container Vessels, Other Cargo Vessels

TANK – FV : Oil Barge, Oil Tankers, Chem-Carrier, ATB

Note: Focus Vessels (FV's) are also considered as Interacting Vessels (IV's) when interacting with another Focus Vessel.

#	VESSEL TYPE	FOCUS VESSEL?	#	VESSEL TYPE	FOCUS VESSEL?
1	BULKCARRIER	CARGO - FV	14	PASSENGERSHIP	NO
2	CHEMICALCARRIER	TANK - FV	15	REFRIGERATEDCARGO	CARGO-FV
3	CONTAINERSHIP	CARGO - FV	16	RESEARCHSHIP	NO
4	DECKSHIPCARGO	CARGO - FV	17	ROROCARGOSHIP	CARGO-FV
5	FERRY	NO	18	ROROCARGOCONTSHIP	CARGO-FV
6	FERRYNONLOCAL	NO	19	SUPPLYOFFSHORE	NO
7	FISHINGFACTORY	NO	20	TUGTOWBARGE	NO
8	FISHINGVESSEL	NO	21	UNKNOWN	NO
9	LIQGASCARRIER	TANK - FV	22	USCOASTGUARD	NO
10	NAVYVESSEL	NO	23	VEHICLECARRIER	CARGO-FV
11	OILTANKER	TANK - FV	24	YACHT	NO
12	OTHERSPECIALCARGO	CARGO - FV	25	ATB	TANK - FV
13	OTHERSPECIFICSERV	NO	26	OIL BARGE	TANK - FV

IMPORTANT:

THE OPERATIVE WORD IN PRESENTING THESE ANALYSIS RESULTS IS THE USE OF THE WORD

POTENTIAL

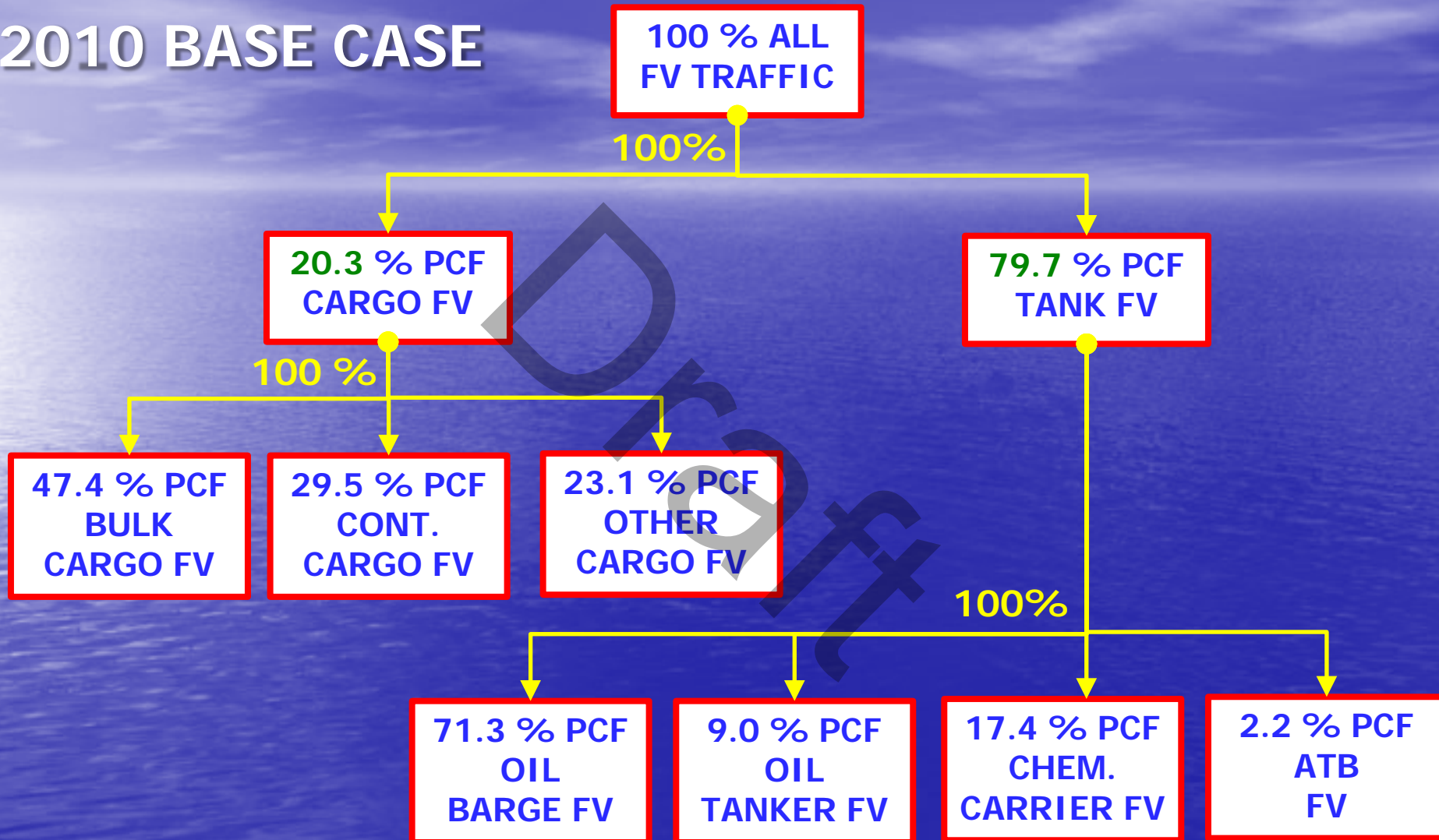
TO INDICATE THAT THESE ANALYSIS RESULTS DO NOT FOLLOW FROM AN HISTORICAL DATA ANALYSIS, BUT THROUGH THE USE OF AN ANALYSIS TOOL THAT EVALUATES SUCH **POTENTIAL**.

THE 2010 YEAR IS CONSIDERED **THE BASE CASE YEAR** AND A BASE CASE YEAR POTENTIAL IS EVALUATED.

NEXT, **WHAT-IF SCENARIOS** ARE DEVELOPED FROM THE BASE CASE BY ADDING ADDITIONAL HYPOTHETICAL TRAFFIC AND A WHAT-IF POTENTIAL IS EVALUATED AND COMPARED **RELATIVE TO THE BASE CASE** TO INFORM **RISK MANAGEMENT**.

A TAXONOMY OF 2010 FOCUS VESSEL POTENTIAL ANNUAL COLLISION FREQUENCY

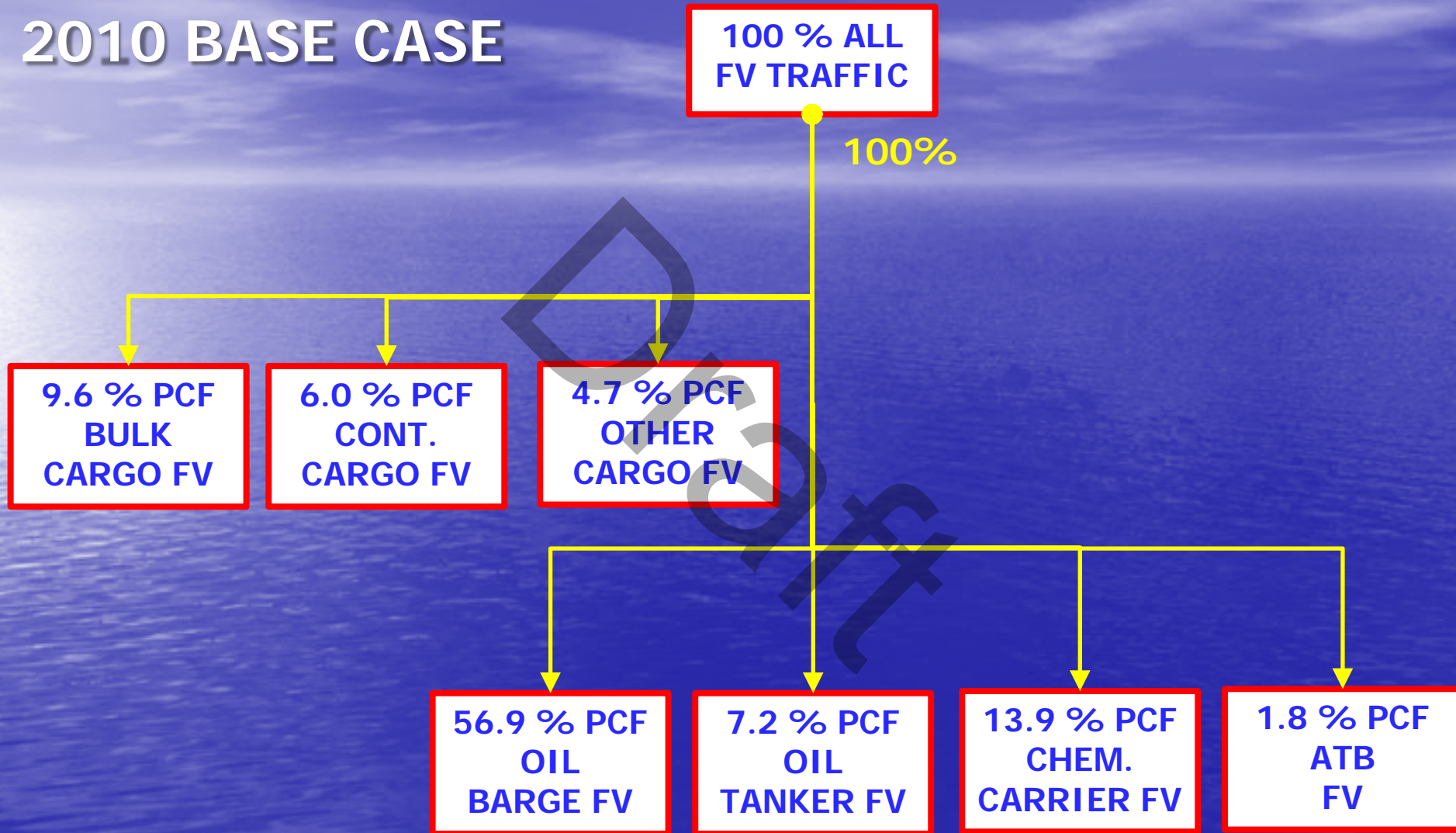
2010 BASE CASE



PCF : POTENTIAL COLLISION FREQUENCY - PER YEAR

A TAXONOMY OF 2010 FOCUS VESSEL POTENTIAL ANNUAL COLLISION FREQUENCY

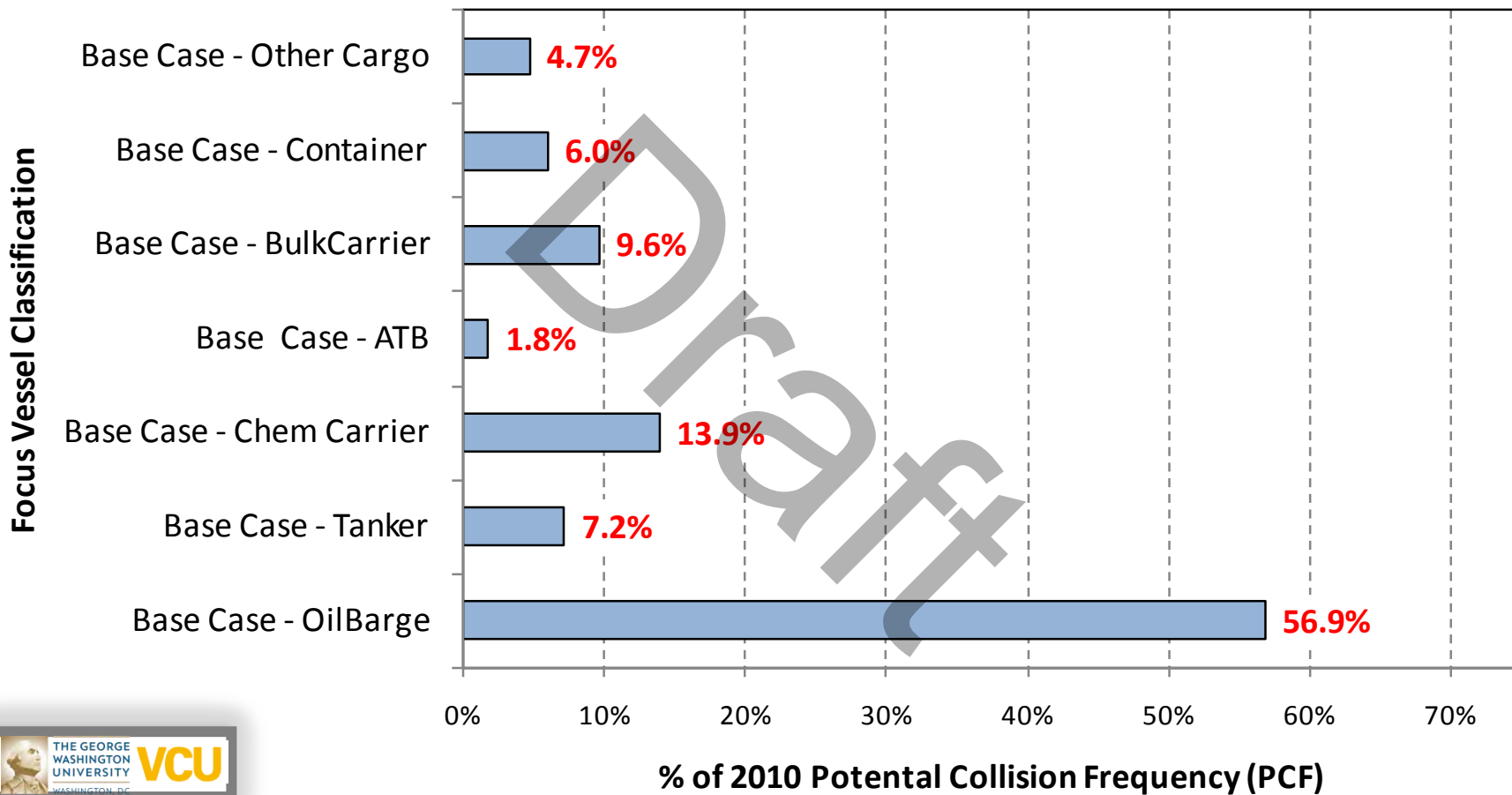
2010 BASE CASE



PCF : POTENTIAL COLLISION FREQUENCY - PER YEAR

2010 BASE CASE

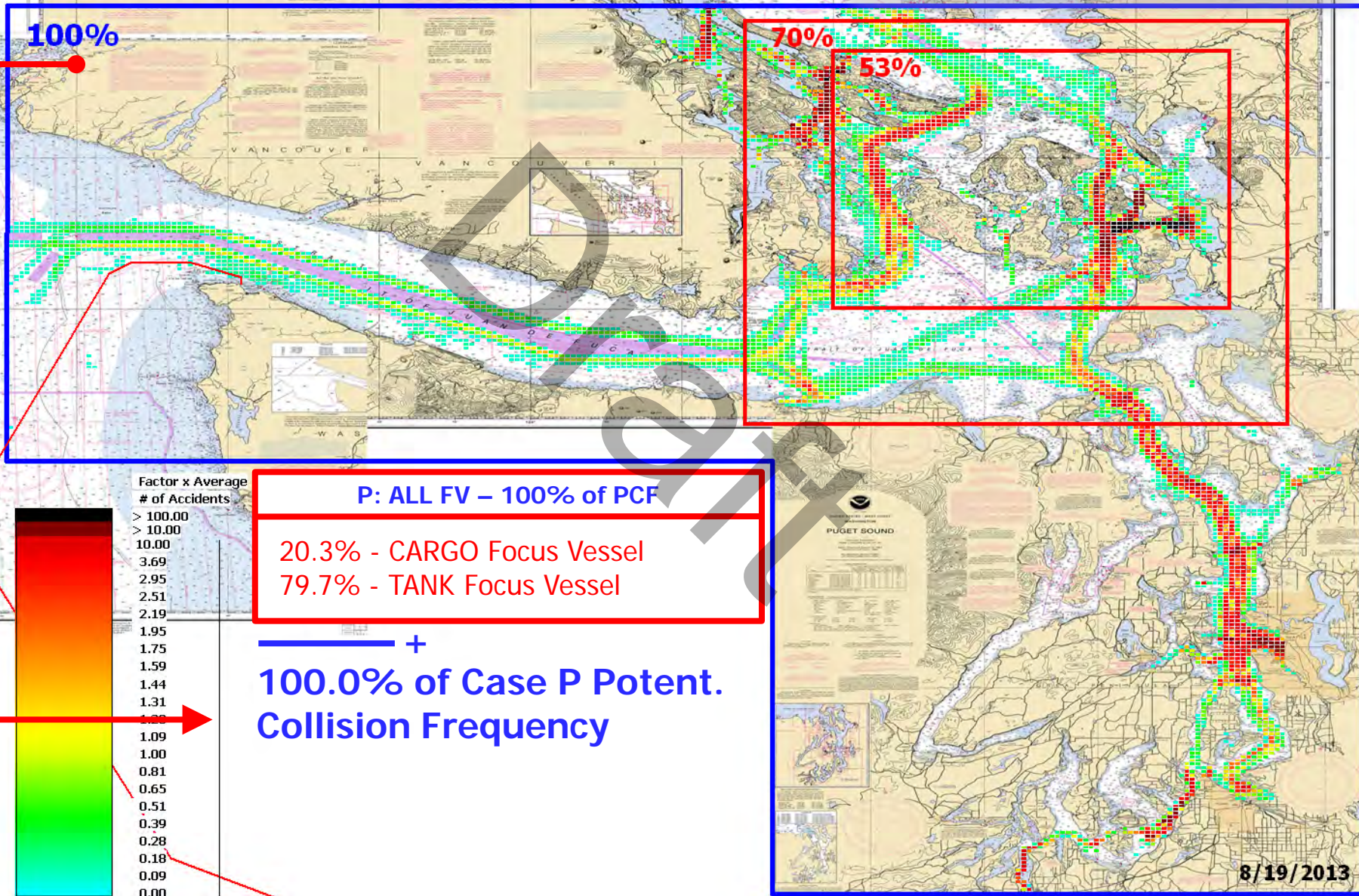
VTRA 2010 - COLLISION FREQUENCY



P: ALL FV POTENTIAL COLL. FREQUENCY (PCF)



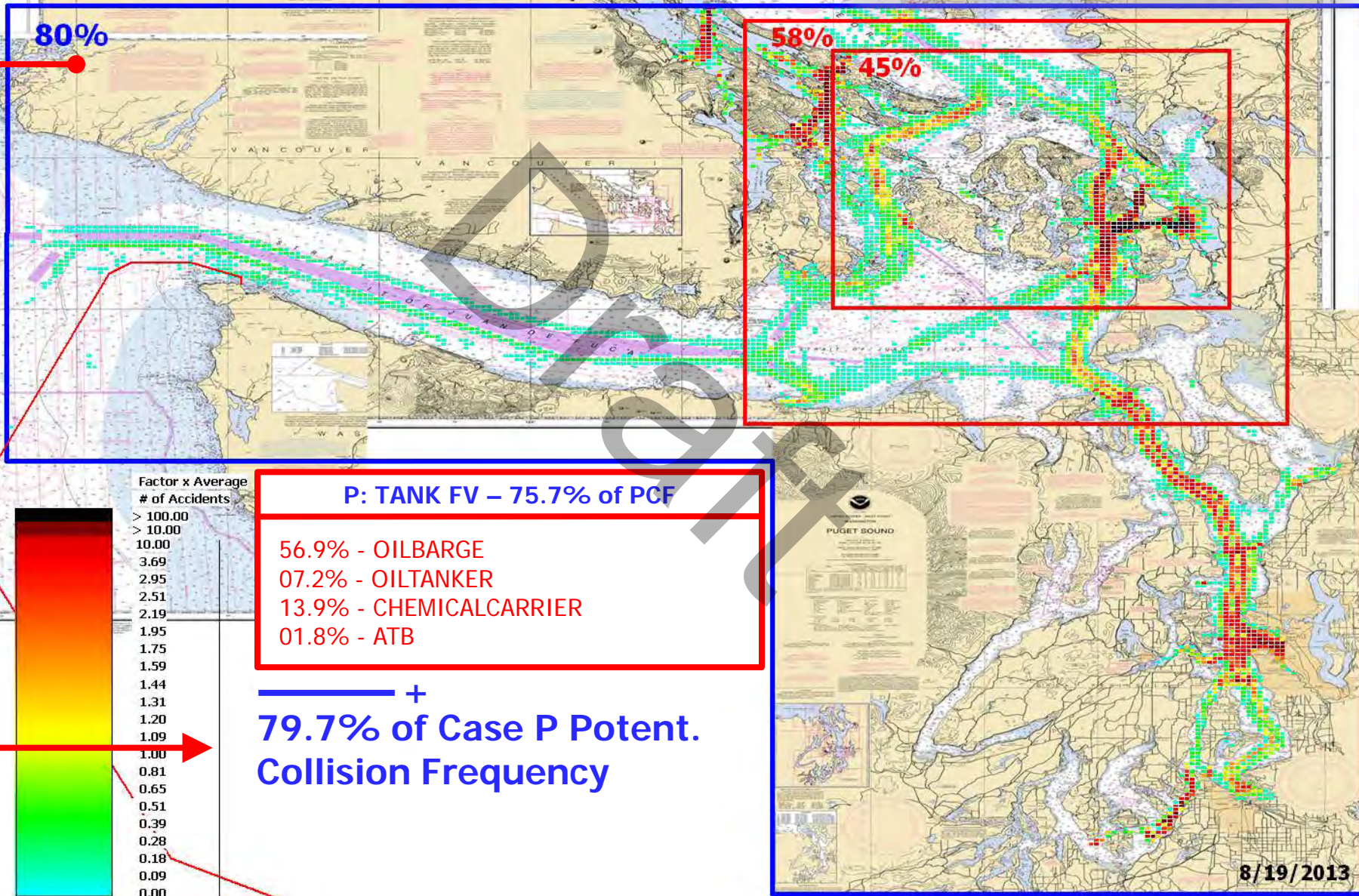
P: VTRA 2010 - BASE CASE - All FV



P: TANK FV POT. COLL. FREQUENCY (PCF)



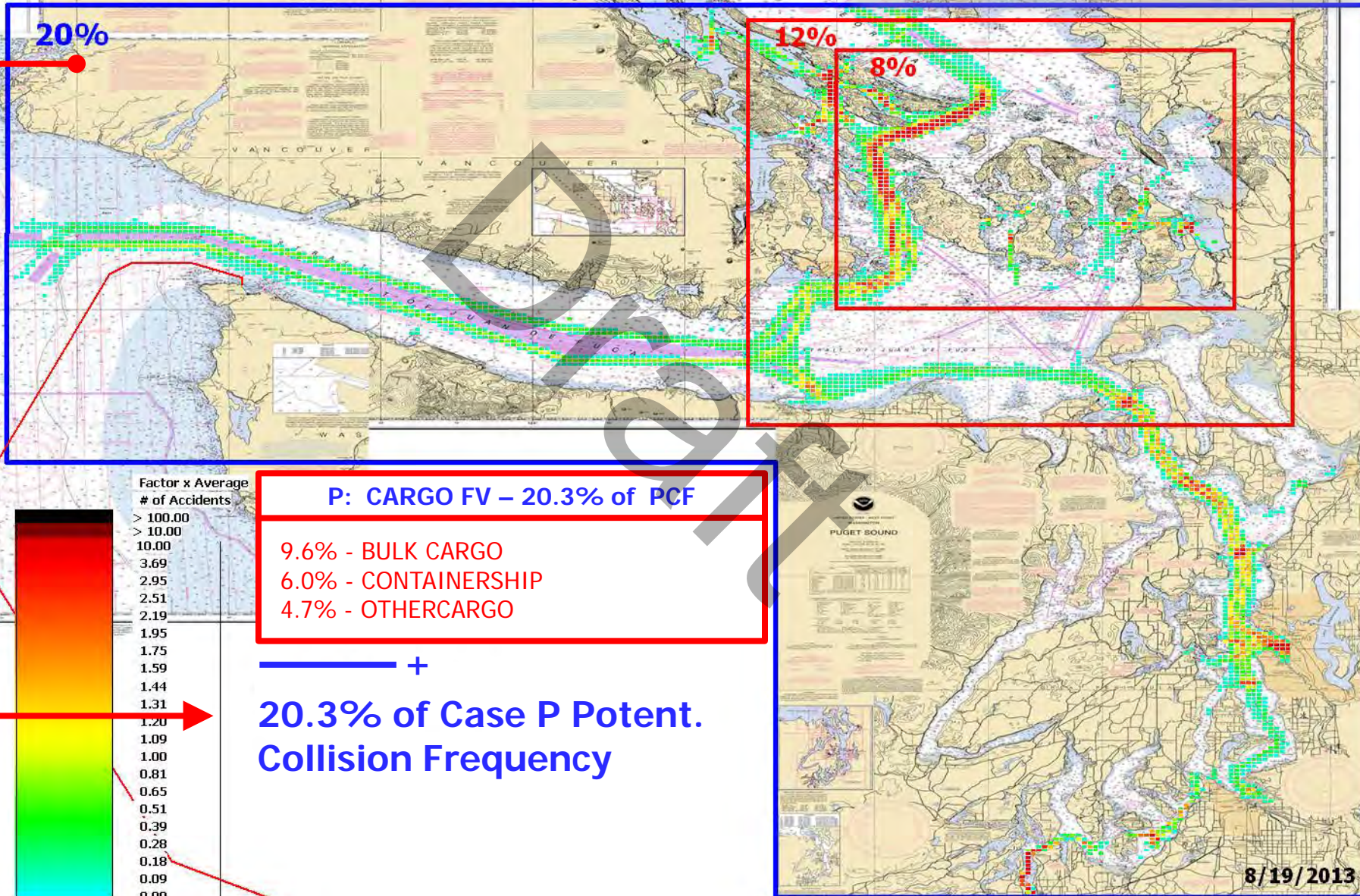
P: VTRA 2010 - BASE CASE - TANK FV



P: CARGO FV POT. COLL. FREQUENCY (PCF)



P: VTRA 2010 - BASE CASE - Cargo FV



20%

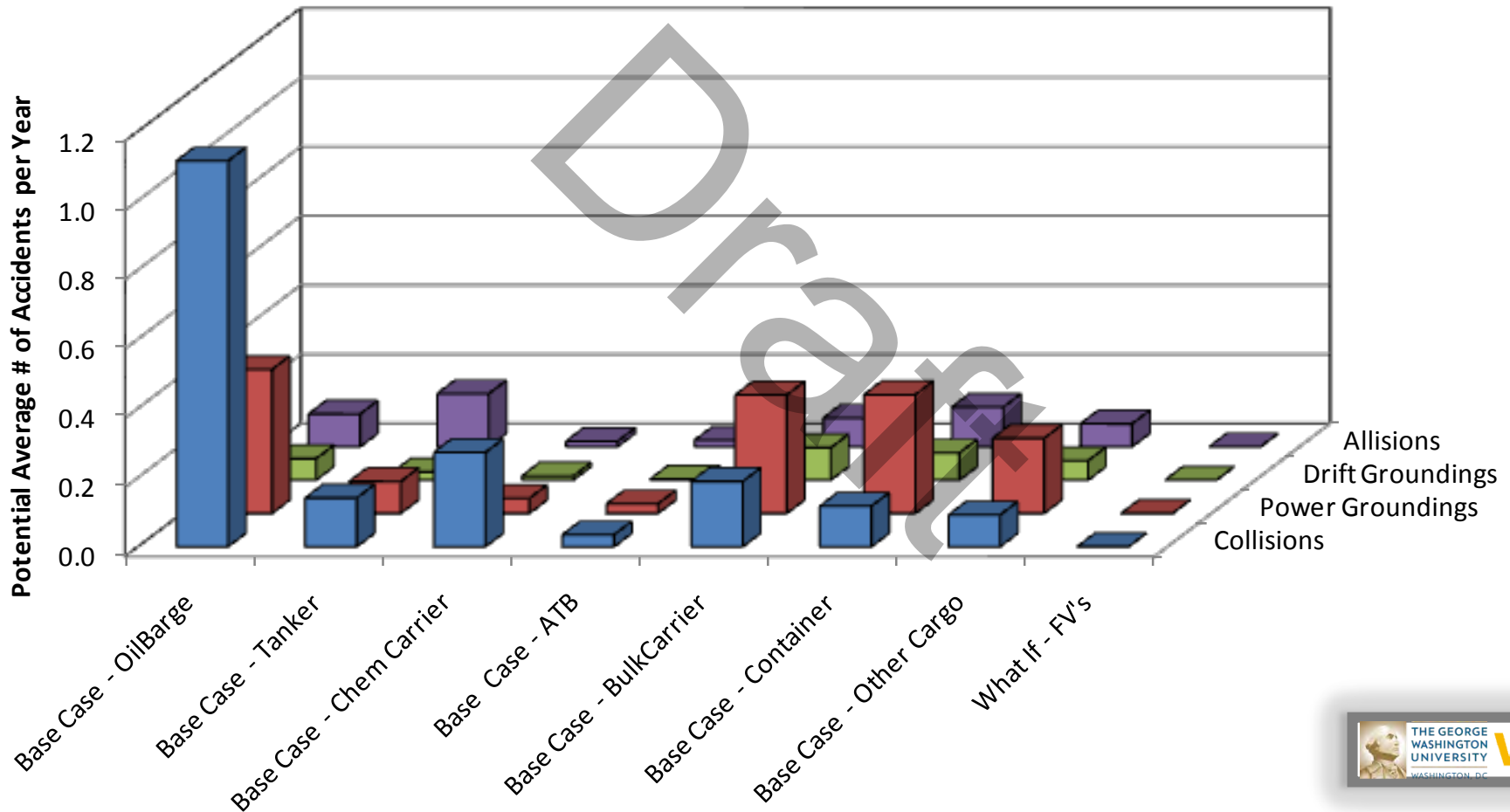
12%

8%

A TAXONOMY OF 2010 FOCUS VESSEL POTENTIAL ACCIDENT FREQUENCY AND ACCIDENT TYPE

2010 BASE CASE

P - VTRA 2010 : Potential Average # of Accidents per Year



P - VTRA 2010 : Potential Average # of Accidents per Year

Focus Vessel	Collisions	Power Groundings	Drift Groundings	Allisions	Total
Base Case - OilBarge	56.9%	28.1%	18.8%	17.3%	39.1%
Base Case - Tanker	7.2%	6.2%	7.2%	28.0%	9.5%
Base Case - Chem Carrier	13.9%	2.9%	3.6%	2.8%	8.0%
Base Case - ATB	1.8%	1.9%	1.0%	3.4%	2.0%
Base Case - All Tank FV's	79.7%	39.1%	30.6%	51.6%	58.5%
Base Case - BulkCarrier	9.6%	23.1%	28.4%	15.2%	16.4%
Base Case - Container	6.0%	23.1%	23.9%	21.0%	15.1%
Base Case - Other Cargo	4.7%	14.6%	17.1%	12.2%	10.0%
Base Case - All Cargo FV's	20.3%	60.9%	69.4%	48.4%	41.5%
Base Case - All FV's	100.0%	100.0%	100.0%	100.0%	100.0%

P - VTRA 2010 : Potential Average # of Accidents per Year

Focus Vessel	Collisions	Power Groundings	Drift Groundings	Allisions	Total
Base Case - OilBarge	1.11	0.42	0.06	0.09	1.69
Base Case - Tanker	0.14	0.09	0.02	0.15	0.41
Base Case - Chem Carrier	0.27	0.04	0.01	0.02	0.34
Base Case - ATB	0.03	0.03	0.00	0.02	0.08
Base Case - All Tank FV's	1.56	0.58	0.10	0.28	2.52
Base Case - BulkCarrier	0.19	0.34	0.09	0.08	0.71
Base Case - Container	0.12	0.34	0.08	0.11	0.65
Base Case - Other Cargo	0.09	0.22	0.06	0.07	0.43
Base Case - All Cargo FV's	0.40	0.90	0.23	0.26	1.79
Base Case - All FV's	1.96	1.48	0.33	0.55	4.32