

Calculation of drag		$F = C_m \rho \frac{\pi}{4} D^2 \dot{u} + C_d \frac{1}{2} \rho D u  u $	
Cd	1	1 m/s	0.25 m/s
Cm	2	46125 N	2882.8125 N
Rho_w	1025 kg/m <sup>3</sup>		
Rho_s	7850 kg/m <sup>3</sup>		
Dy	2 m		
u	1 m/s		
L	45 m		
t	0.1 m		
Vol	26.86 m <sup>3</sup>		
Disp	141.4		

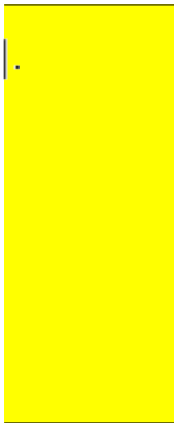
Calculation of weight in air and water [N]		With wire expansion set at approx.	
		+ nodal mass	single wires
Weight in air	2.07E+006	5.48E+006	2741187.92
Weight in water	6.47E+005	4.06E+006	2030424.18

Calculation of weight in air and water [N]		Through a normal run(1 m/s). The	
		+ nodal mass	single wires
Weight in air	2.07E+006	5.48E+006	2.74E+006
Weight in water	6.47E+005	4.06E+006	2.03E+006

Calculation of weight in air and water [N]		Through a normal run(0.5 m/s). Th	
		+ nodal mass	single wires
Weight in air	2.07E+006	5.48E+006	2.74E+006
Weight in water	6.47E+005	4.06E+006	2.03E+006

Calculation of weight in air and water [N]		Through a normal run(0.25 m/s). Tl	
		+ nodal mass	single wires
Weight in air	2.07E+006	5.48E+006	2.74E+006
Weight in water	6.47E+005	4.06E+006	2.03E+006

## Morison



1 m/s  
 Drag OFF 2.01E+006  
 Drag ON 1.99E+006  
 Diff 27550 1.37%  
 Diff from hand 18575 40.27% Hand>USFOS

0.25 m/s  
 Drag OFF 2.03E+006  
 Drag ON 2.02E+006  
 Diff 2560 0.13%  
 Diff from hand 322.8125 11.20% Hand>USFOS

### x. 0 and raising and lowering the water level

USFOS	Diff (U-H)	Error
2.74E+006	2.08E+000	0.0001%
2.03E+006	6.96E+002	0.0343%

### the drag is off when calculating weight in water

USFOS	Diff (U-H)	Error
2.72E+006	-1.73E+004	0.6296%
2.01E+006	-1.67E+004	0.8217%

### the drag is off when calculating weight in water

USFOS	Diff (U-H)	Error
2.73E+006	-8.69E+003	0.3169%
2.02E+006	-7.99E+003	0.3937%

### the drag is off when calculating weight in water

USFOS	Diff (U-H)	Error
2.74E+006	-4.35E+003	0.1586%
2.02E+006	-6.21E+003	0.3061%

Morison

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;

# Slamming

USFOS					MATLAB. Only Slam	
time	disp	vel	Slam ON 1 m/s Force	Slam OFF 1 m/s	Time	Force
47.840	-47.995	-1.000	2723832.400	2723848.200	0	237543.750
47.850	-48.005	-1.000	2723829.000	2723845.000	0.01	219061.176
47.860	-48.015	-0.998	2723487.000	2723834.200	0.02	203282.534
47.870	-48.025	-0.994	2722455.000	2723810.400	0.03	189658.420
47.880	-48.035	-0.990	2720758.200	2723768.000	0.04	177778.830
47.890	-48.045	-0.986	2718459.400	2723701.000	0.05	167331.587
47.900	-48.055	-0.983	2715586.200	2723603.200	0.06	158074.804
47.910	-48.064	-0.980	2712183.000	2723470.400	0.07	149818.157
47.920	-48.074	-0.977	2708286.000	2723297.000	0.08	142409.839
47.930	-48.084	-0.974	2703931.400	2723072.400	0.09	135727.288
47.940	-48.094	-0.972	2699151.000	2722783.200	0.1	129670.465
47.950	-48.103	-0.969	2693980.400	2722415.200	0.11	124156.909
47.960	-48.113	-0.967	2688461.400	2721956.200	0.12	119118.041
47.970	-48.123	-0.965	2682638.000	2721393.200	0.13	114496.356
47.980	-48.132	-0.964	2676556.000	2720715.000	0.14	110243.278
47.990	-48.142	-0.963	2670258.200	2719911.000	0.15	106317.491
48.000	-48.152	-0.962	2663790.000	2718971.000	0.16	102683.631
48.010	-48.161	-0.961	2657193.000	2717885.200	0.17	99311.252
48.020	-48.171	-0.960	2650508.200	2716646.400	0.18	96173.998
48.030	-48.180	-0.960	2643778.000	2715248.000	0.19	93248.941
48.040	-48.190	-0.960	2637043.200	2713682.200	0.2	90516.042
48.050	-48.200	-0.960	2630349.000	2711945.000	0.21	87957.704
48.060	-48.209	-0.961	2623739.000	2710032.000	0.22	85558.420
48.070	-48.219	-0.961	2617251.200	2707940.400	0.23	83304.462
48.080	-48.229	-0.962	2610914.400	2705668.200	0.24	81183.641
48.090	-48.238	-0.963	2604754.000	2703215.000	0.25	79185.094
48.100	-48.248	-0.965	2598793.000	2700580.000	0.26	77299.106
48.110	-48.257	-0.966	2593053.400	2697765.000	0.27	75516.966
48.120	-48.267	-0.967	2587555.000	2694773.000	0.28	73830.841
48.130	-48.277	-0.969	2582315.200	2691607.000	0.29	72233.664
48.140	-48.286	-0.971	2577353.000	2688271.000	0.3	70719.045
48.150	-48.296	-0.972	2572684.000	2684767.400	0.31	69281.193
48.160	-48.306	-0.974	2568321.000	2681096.000	0.32	67914.847
48.170	-48.316	-0.976	2564269.000	2677257.000	0.33	66615.213
48.180	-48.325	-0.978	2560534.000	2673251.000	0.34	65377.919
48.190	-48.335	-0.980	2557117.200	2669081.000	0.35	64198.965
48.200	-48.345	-0.982	2554018.200	2664750.000	0.36	63074.688
48.210	-48.355	-0.983	2551234.000	2660261.200	0.37	62001.723
48.220	-48.365	-0.985	2548759.200	2655622.000	0.38	60976.977
48.230	-48.375	-0.987	2546589.000	2650836.000	0.39	59997.601
48.240	-48.384	-0.989	2544716.000	2645911.200	0.4	59060.966
48.250	-48.394	-0.991	2543132.200	2640855.000	0.41	58164.641
48.260	-48.404	-0.992	2541829.200	2635675.000	0.42	57306.376
48.270	-48.414	-0.994	2540796.000	2630381.000	0.43	56484.088
48.280	-48.424	-0.995	2540020.000	2624982.000	0.44	55695.840
48.290	-48.434	-0.997	2539485.200	2619487.400	0.45	54939.834
48.300	-48.444	-0.998	2539176.200	2613909.000	0.46	54214.395
48.310	-48.454	-0.999	2539075.000	2608257.000	0.47	53517.963
48.320	-48.464	-1.001	2539163.000	2602543.000	0.48	52849.081
48.330	-48.474	-1.002	2539420.400	2596778.000	0.49	52206.389

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48.340	-48.484	-1.002	2539829.000	2590974.200	0.5	51588.616
48.350	-48.494	-1.003	2540369.000	2585144.000	0.51	50994.570
48.360	-48.504	-1.004	2541019.400	2579298.200	0.52	50423.135
48.370	-48.514	-1.004	2541759.400	2573450.000	0.53	49873.264
48.380	-48.524	-1.005	2542565.000	2567611.000	0.54	49343.972
48.390	-48.534	-1.005	2543410.000	2561793.000	0.55	48834.336
48.400	-48.544	-1.005	2544268.000	2556007.000	0.56	48343.484
48.410	-48.554	-1.005	2545114.000	2550265.000	0.57	47870.598
48.420	-48.564	-1.005	2545921.400	2544577.400	0.58	47414.905
48.430	-48.574	-1.004	2546667.000	2538956.000	0.59	46975.677
48.440	-48.585	-1.004	2547325.400	2533410.000	0.6	46552.223
48.450	-48.595	-1.003	2547875.000	2527949.000	0.61	46143.896
48.460	-48.605	-1.002	2548294.000	2522582.400	0.62	45750.078
48.470	-48.615	-1.002	2548560.000	2517319.000	0.63	45370.189
48.480	-48.625	-1.001	2548652.000	2512166.000	0.64	45003.675
48.490	-48.635	-0.999	2548549.000	2507129.000	0.65	44650.016
48.500	-48.645	-0.998	2548228.000	2502210.400	0.66	44308.715
48.510	-48.655	-0.997	2547668.000	2497413.000	0.67	43979.300
48.520	-48.665	-0.995	2546849.400	2492738.000	0.68	43661.326
48.530	-48.674	-0.994	2545756.000	2488186.000	0.69	43354.367
48.540	-48.684	-0.992	2544372.000	2483757.000	0.7	43058.019
48.550	-48.694	-0.990	2542683.000	2479450.000	0.71	42771.898
48.560	-48.704	-0.988	2540678.200	2475265.000	0.72	42495.636
48.570	-48.714	-0.986	2538347.200	2471198.400	0.73	42228.886
48.580	-48.724	-0.984	2535682.000	2467249.000	0.74	41971.314
48.590	-48.734	-0.982	2532676.000	2463412.000	0.75	41722.603
48.600	-48.744	-0.980	2529324.000	2459684.400	0.76	41482.451
48.610	-48.753	-0.978	2525624.000	2456062.000	0.77	41250.567
48.620	-48.763	-0.976	2521574.200	2452539.000	0.78	41026.676
48.630	-48.773	-0.974	2517177.200	2449109.200	0.79	40810.514
48.640	-48.783	-0.972	2512437.000	2445768.000	0.8	40601.827
48.650	-48.792	-0.970	2507357.400	2442508.000	0.81	40400.374
48.660	-48.802	-0.968	2501947.400	2439322.400	0.82	40205.924
48.670	-48.812	-0.966	2496216.000	2436204.000	0.83	40018.255
48.680	-48.821	-0.964	2490173.000	2433145.000	0.84	39837.154
48.690	-48.831	-0.962	2483831.000	2430137.200	0.85	39662.418
48.700	-48.841	-0.961	2477204.000	2427173.000	0.86	39493.851
48.710	-48.850	-0.959	2470306.200	2424244.000	0.87	39331.267
48.720	-48.860	-0.958	2463155.200	2421341.000	0.88	39174.485
48.730	-48.869	-0.956	2455769.000	2418456.200	0.89	39023.332
48.740	-48.879	-0.955	2448165.400	2415580.400	0.9	38877.643
48.750	-48.888	-0.954	2440367.000	2412706.000	0.91	38737.257
48.760	-48.898	-0.953	2432393.000	2409823.000	0.92	38602.023
48.770	-48.907	-0.952	2424267.000	2406924.200	0.93	38471.792
48.780	-48.917	-0.951	2416011.000	2404000.400	0.94	38346.422
48.790	-48.927	-0.950	2407648.000	2401044.400	0.95	38225.776
48.800	-48.936	-0.950	2399202.000	2398048.000	0.96	38109.724
48.810	-48.946	-0.949	2390696.000	2395003.000	0.97	37998.138
48.820	-48.955	-0.949	2382154.400	2391903.000	0.98	37890.897
48.830	-48.965	-0.949	2373601.400	2388740.000	0.99	37787.882
48.840	-48.974	-0.949	2365060.400	2385508.400	1	37688.980
48.850	-48.983	-0.949	2356556.000	2382202.200	1.01	37594.083
48.860	-48.993	-0.950	2348111.000	2378815.200	1.02	37503.083

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48.870	-49.002	-0.950	2339748.000	2375342.400	1.03	37415.880
48.880	-49.012	-0.951	2331501.000	2371780.000	1.04	37332.375
48.890	-49.022	-0.952	2323401.200	2368122.000	1.05	37252.473
48.900	-49.031	-0.953	2315469.000	2364366.200	1.06	37176.082
48.910	-49.041	-0.954	2307720.400	2360509.200	1.07	37103.113
48.920	-49.050	-0.955	2300174.000	2356549.000	1.08	37033.482
48.930	-49.060	-0.956	2292844.200	2352483.000	1.09	36967.104
48.940	-49.069	-0.958	2285747.000	2348310.200	1.1	36903.899
48.950	-49.079	-0.959	2278894.000	2344030.000	1.11	36843.791
48.960	-49.088	-0.961	2272298.000	2339642.200	1.12	36786.704
48.970	-49.098	-0.962	2265969.200	2335148.000	1.13	36732.566
48.980	-49.108	-0.964	2259917.400	2330547.000	1.14	36681.305
48.990	-49.117	-0.966	2254149.000	2325841.000	1.15	36632.855
49.000	-49.127	-0.967	2248670.000	2321033.400	1.16	36587.148
49.010	-49.137	-0.969	2243483.400	2316126.200	1.17	36544.122
49.020	-49.146	-0.971	2238593.000	2311123.000	1.18	36503.714
49.030	-49.156	-0.973	2233998.000	2306026.200	1.19	36465.864
49.040	-49.166	-0.974	2229698.000	2300842.000	1.2	36430.513
49.050	-49.176	-0.976	2225691.000	2295573.000	1.21	36397.606
49.060	-49.185	-0.978	2221973.000	2290226.000	1.22	36367.088
49.070	-49.195	-0.980	2218539.000	2284805.000	1.23	36338.905
49.080	-49.205	-0.981	2215381.400	2279317.000	1.24	36313.005
49.090	-49.215	-0.983	2212493.200	2273767.200	1.25	36289.340
49.100	-49.225	-0.984	2209863.400	2268163.000	1.26	36267.859
49.110	-49.234	-0.986	2207482.000	2262510.000	1.27	36248.516
49.120	-49.244	-0.987	2205335.400	2256815.200	1.28	36231.265
49.130	-49.254	-0.989	2203411.000	2251086.200	1.29	36216.061
49.140	-49.264	-0.990	2201693.200	2245330.000	1.3	36202.862
49.150	-49.274	-0.991	2200167.200	2239554.000	1.31	36191.624
49.160	-49.284	-0.992	2198816.400	2233765.000	1.32	36182.307
49.170	-49.294	-0.993	2197624.000	2227971.000	1.33	36174.871
49.180	-49.304	-0.994	2196571.200	2222178.000	1.34	36169.278
49.190	-49.314	-0.994	2195640.200	2216395.000	1.35	36165.489
49.200	-49.324	-0.995	2194812.000	2210628.000	1.36	36163.469
49.210	-49.334	-0.996	2194066.200	2204884.200	1.37	36163.181
49.220	-49.344	-0.996	2193384.000	2199171.000	1.38	36164.591
49.230	-49.354	-0.996	2192744.000	2193495.000	1.39	36167.664
49.240	-49.363	-0.996	2192127.000	2187861.400	1.4	36172.369
49.250	-49.373	-0.996	2191513.000	2182278.000	1.41	36178.673
49.260	-49.383	-0.996	2190881.000	2176749.200	1.42	36186.545
49.270	-49.393	-0.996	2190212.400	2171282.000	1.43	36195.954
49.280	-49.403	-0.996	2189488.200	2165880.200	1.44	36206.871
49.290	-49.413	-0.995	2188693.000	2160553.000	1.45	36219.267
49.300	-49.423	-0.995	2187810.200	2155307.200	1.46	36233.114
49.310	-49.433	-0.994	2186827.000	2150150.200	1.47	36248.384
49.320	-49.443	-0.993	2185729.000	2145088.400	1.48	36265.051
49.330	-49.453	-0.993	2184502.000	2140128.200	1.49	36283.089
49.340	-49.463	-0.992	2183134.000	2135275.000	1.5	36302.472
49.350	-49.473	-0.991	2181614.000	2130533.400	1.51	36323.175
49.360	-49.483	-0.990	2179930.000	2125908.000	1.52	36345.175
49.370	-49.493	-0.989	2178073.000	2121403.000	1.53	36368.447
49.380	-49.503	-0.988	2176034.000	2117020.000	1.54	36392.969
49.390	-49.512	-0.987	2173805.200	2112763.000	1.55	36418.718

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49.400	-49.522	-0.986	2171380.000	2108633.000	1.56	36445.672
49.410	-49.532	-0.984	2168752.200	2104630.000	1.57	36473.810
49.420	-49.542	-0.983	2165917.200	2100756.200	1.58	36503.111
49.430	-49.552	-0.982	2162872.000	2097011.000	1.59	36533.554
49.440	-49.562	-0.981	2159612.200	2093392.000	1.6	36565.120
49.450	-49.571	-0.979	2156138.400	2089899.100	1.61	36597.789
49.460	-49.581	-0.978	2152449.400	2086530.000	1.62	36631.541
49.470	-49.591	-0.977	2148546.200	2083281.000	1.63	36666.359
49.480	-49.601	-0.976	2144430.400	2080149.200	1.64	36702.224
49.490	-49.611	-0.974	2140106.000	2077131.000	1.65	36739.119
49.500	-49.620	-0.973	2135575.000	2074221.000	1.66	36777.025
49.510	-49.630	-0.972	2130844.200	2071415.000	1.67	36815.927
49.520	-49.640	-0.971	2125920.000	2068706.200	1.68	36855.807
49.530	-49.649	-0.970	2120807.200	2066090.000	1.69	36896.649
49.540	-49.659	-0.969	2115516.000	2063559.000	1.7	36938.438
49.550	-49.669	-0.968	2110053.400	2061107.000	1.71	36981.157
49.560	-49.678	-0.967	2104430.000	2058726.200	1.72	37024.791
49.570	-49.688	-0.966	2098656.000	2056410.000	1.73	37069.327
49.580	-49.698	-0.965	2092741.100	2054149.100	1.74	37114.749
49.590	-49.707	-0.964	2086698.200	2051937.000	1.75	37161.042
49.600	-49.717	-0.963	2080539.100	2049765.000	1.76	37208.194
49.610	-49.727	-0.963	2074277.000	2047624.100	1.77	37256.189
49.620	-49.736	-0.962	2067927.100	2045509.300	1.78	37305.016
49.630	-49.746	-0.962	2061510.000	2043418.000	1.79	37354.661
49.640	-49.756	-0.962	2055045.000	2041346.400	1.8	37405.111
49.650	-49.765	-0.961	2048551.000	2039293.000	1.81	37456.354
49.660	-49.775	-0.961	2042047.400	2037255.000	1.82	37508.377
49.670	-49.784	-0.961	2035555.000	2035228.300	1.83	37561.168
49.680	-49.794	-0.962	2029092.300	2033212.000	1.84	37614.716
49.690	-49.804	-0.962	2022678.300	2031201.000	1.85	37669.009
49.700	-49.813	-0.962	2016332.000	2029194.100	1.86	37724.035
49.710	-49.823	-0.963	2010071.100	2027188.000	1.87	37779.784
49.720	-49.832	-0.963	2003913.400	2025179.200	1.88	37836.245
49.730	-49.842	-0.964	1997876.300	2023166.000	1.89	37893.407
49.740	-49.852	-0.965	1991976.000	2021144.100	1.9	37951.260
49.750	-49.861	-0.966	1986228.000	2019112.000	1.91	38009.793
49.760	-49.871	-0.967	1980646.100	2017066.400	1.92	38068.997
49.770	-49.881	-0.968	1975245.200	2015005.000	1.93	38128.862
49.780	-49.890	-0.969	1970038.000	2012925.200	1.94	38189.377
49.790	-49.900	-0.970	1965035.000	2010825.000	1.95	38250.534
49.800	-49.910	-0.972	1960248.000	2008701.000	1.96	38312.323
49.810	-49.920	-0.973	1955685.400	2006552.000	1.97	38374.736
49.820	-49.929	-0.974	1951357.000	2004376.000	1.98	38437.763
49.830	-49.939	-0.976	1947269.000	2002171.000	1.99	38501.396
49.840	-49.949	-0.977	1943428.000	1999937.200	2	38565.625
49.850	-49.959	-0.979	1939844.200	1997680.100		
49.860	-49.968	-0.980	1936529.000	1995406.000		
49.870	-49.978	-0.982	1933491.400	1993120.300		
49.880	-49.988	-0.984	1930740.000	1990830.200		
49.890	-49.998	-0.985	1928281.000	1988541.400		
49.900	-50.008	-0.987	1926120.000	1986260.300		
49.910	-50.018	-0.989	1924260.400	1983993.300		
49.920	-50.028	-0.991	1922707.000	1981749.000		

# Slamming

49.930	-50.037	-0.993	1921464.300	1979537.000
49.940	-50.047	-0.994	1920537.000	1977368.000
49.950	-50.057	-0.996	1919927.200	1975252.100
49.960	-50.067	-0.998	1919637.000	1973199.400
49.970	-50.077	-1.000	1919666.000	1971219.300
49.980	-50.087	-1.002	1920012.000	1969321.000
49.990	-50.097	-1.004	1920672.000	1967513.000
50.000	-50.107	-1.006	1921641.000	1965803.000
50.010	-50.117	-1.008	1922913.300	1964199.200
50.020	-50.128	-1.009	1924481.000	1962709.000
50.030	-50.138	-1.011	1926335.000	1961338.000
50.040	-50.148	-1.013	1928465.200	1960093.000
50.050	-50.158	-1.014	1930860.000	1958979.000
50.060	-50.168	-1.016	1933506.200	1958000.100
50.070	-50.178	-1.017	1936390.400	1957161.100
50.080	-50.188	-1.018	1939498.000	1956465.000
50.090	-50.199	-1.020	1942811.300	1955914.300
50.100	-50.209	-1.021	1946315.300	1955511.000
50.110	-50.219	-1.022	1949992.000	1955256.100
50.120	-50.229	-1.023	1953822.000	1955150.300
50.130	-50.239	-1.024	1957787.000	1955193.100
50.140	-50.250	-1.024	1961867.000	1955384.000
50.150	-50.260	-1.025	1966042.000	1955720.400
50.160	-50.270	-1.025	1970292.000	1956201.000
50.170	-50.280	-1.026	1974596.000	1956822.100
50.180	-50.291	-1.026	1978933.100	1957580.200
50.190	-50.301	-1.026	1983283.000	1958471.100
50.200	-50.311	-1.026	1987624.000	1959490.000
50.210	-50.321	-1.026	1991936.200	1960631.000
50.220	-50.332	-1.025	1996199.000	1961888.000
50.230	-50.342	-1.025	2000392.000	1963255.000
50.240	-50.352	-1.024	2004496.000	1964724.000
50.250	-50.362	-1.024	2008491.000	1966288.000
50.260	-50.373	-1.023	2012360.000	1967939.200
50.270	-50.383	-1.022	2016083.300	1969669.100
50.280	-50.393	-1.021	2019646.000	1971469.100
50.290	-50.403	-1.020	2023030.000	1973330.200
50.300	-50.414	-1.019	2026221.000	1975243.200
50.310	-50.424	-1.018	2029205.000	1977199.000
50.320	-50.434	-1.016	2031968.000	1979187.300
50.330	-50.444	-1.015	2034499.000	1981199.100
50.340	-50.454	-1.014	2036786.000	1983225.000
50.350	-50.464	-1.012	2038820.000	1985254.000
50.360	-50.474	-1.011	2040593.000	1987277.200
50.370	-50.485	-1.009	2042097.000	1989285.200
50.380	-50.495	-1.007	2043326.300	1991268.200
50.390	-50.505	-1.006	2044277.000	1993217.000
50.400	-50.515	-1.004	2044946.000	1995122.200
50.410	-50.525	-1.002	2045331.000	1996975.200
50.420	-50.535	-1.001	2045431.400	1998767.300
50.430	-50.545	-0.999	2045249.100	2000490.300
50.440	-50.555	-0.997	2044786.000	2002137.000
50.450	-50.565	-0.996	2044046.000	2003698.100



# Slamming

50.460	-50.575	-0.994	2043033.000	2005168.300
50.470	-50.585	-0.992	2041754.200	2006541.000
50.480	-50.595	-0.991	2040217.000	2007809.000
50.490	-50.604	-0.989	2038430.000	2008967.300
50.500	-50.614	-0.988	2036403.000	2010012.000
50.510	-50.624	-0.987	2034146.100	2010937.000
50.520	-50.634	-0.985	2031672.200	2011739.100
50.530	-50.644	-0.984	2028994.100	2012416.000
50.540	-50.654	-0.983	2026125.300	2012964.000
50.550	-50.664	-0.982	2023081.000	2013381.300
50.560	-50.673	-0.981	2019876.000	2013667.100
50.570	-50.683	-0.980	2016526.100	2013821.000
50.580	-50.693	-0.979	2013049.000	2013841.200
50.590	-50.703	-0.979	2009462.000	2013730.100
50.600	-50.713	-0.978	2005781.200	2013488.100
50.610	-50.722	-0.978	2002026.100	2013117.200
50.620	-50.732	-0.977	1998215.000	2012620.000
50.630	-50.742	-0.977	1994365.300	2011999.100
50.640	-50.752	-0.977	1990497.000	2011258.300
50.650	-50.761	-0.977	1986627.000	2010402.000
50.660	-50.771	-0.977	1982775.000	2009434.400
50.670	-50.781	-0.977	1978959.000	2008361.100
50.680	-50.791	-0.978	1975197.000	2007188.000
50.690	-50.800	-0.978	1971506.300	2005920.000
50.700	-50.810	-0.979	1967905.000	2004564.300
50.710	-50.820	-0.979	1964409.000	2003128.400
50.720	-50.830	-0.980	1961035.000	2001619.000
50.730	-50.840	-0.981	1957798.000	2000044.000
50.740	-50.849	-0.982	1954712.300	1998411.000
50.750	-50.859	-0.983	1951793.200	1996728.000
50.760	-50.869	-0.984	1949053.000	1995003.000
50.770	-50.879	-0.985	1946504.000	1993245.000
50.780	-50.889	-0.986	1944157.300	1991462.400
50.790	-50.899	-0.987	1942023.200	1989664.100
50.800	-50.909	-0.989	1940111.000	1987858.300
50.810	-50.918	-0.990	1938428.000	1986054.000
50.820	-50.928	-0.991	1936981.300	1984259.300
50.830	-50.938	-0.993	1935777.100	1982483.300
50.840	-50.948	-0.994	1934820.000	1980734.100
50.850	-50.958	-0.996	1934112.000	1979020.000
50.860	-50.968	-0.997	1933656.400	1977349.000
50.870	-50.978	-0.999	1933454.000	1975728.400
50.880	-50.988	-1.000	1933504.100	1974166.300
50.890	-50.998	-1.002	1933805.300	1972670.000
50.900	-51.008	-1.003	1934355.000	1971245.200
50.910	-51.018	-1.005	1935149.100	1969899.300
50.920	-51.028	-1.006	1936183.000	1968638.200
50.930	-51.038	-1.008	1937450.000	1967467.300
50.940	-51.048	-1.009	1938943.000	1966392.000
50.950	-51.058	-1.010	1940654.000	1965416.400
50.960	-51.069	-1.011	1942573.000	1964545.200
50.970	-51.079	-1.013	1944691.000	1963782.000
50.980	-51.089	-1.014	1946995.300	1963129.100

# Slamming

50.990	-51.099	-1.015	1949475.400	1962590.000		
51.000	-51.109	-1.016	1952118.000	1962166.200		
51.010	-51.119	-1.017	1954910.000	1961859.300		
51.020	-51.129	-1.017	1957836.000	1961670.200		
51.030	-51.140	-1.018	1960883.000	1961599.200		

# Slamming

Calculations		
Slam off + MATLAB(hand)	Diff in USFOS (OFF-NO)	Diff from hand(MATLAB- diff USFOS)
2961391.950	15.800	237527.950
2942906.176	16.000	219045.176
2927116.734	347.200	202935.334
2913468.820	1355.400	188303.020
2901546.830	3009.800	174769.030
2891032.587	5241.600	162089.987
2881678.004	8017.000	150057.804
2873288.557	11287.400	138530.757
2865706.839	15011.000	127398.839
2858799.688	19141.000	116586.288
2852453.665	23632.200	106038.265
2846572.109	28434.800	95722.109
2841074.241	33494.800	85623.241
2835889.556	38755.200	75741.156
2830958.278	44159.000	66084.278
2826228.491	49652.800	56664.691
2821654.631	55181.000	47502.631
2817196.452	60692.200	38619.052
2812820.398	66138.200	30035.798
2808496.941	71470.000	21778.941
2804198.242	76639.000	13877.042
2799902.704	81596.000	6361.704
2795590.420	86293.000	734.580
2791244.862	90689.200	7384.738
2786851.841	94753.800	13570.159
2782400.094	98461.000	19275.906
2777879.106	101787.000	24487.894
2773281.966	104711.600	29194.634
2768603.841	107218.000	33387.159
2763840.664	109291.800	37058.136
2758990.045	110918.000	40198.955
2754048.593	112083.400	42802.207
2749010.847	112775.000	44860.153
2743872.213	112988.000	46372.787
2738628.919	112717.000	47339.081
2733279.965	111963.800	47764.835
2727824.688	110731.800	47657.112
2722262.923	109027.200	47025.477
2716598.977	106862.800	45885.823
2710833.601	104247.000	44249.399
2704972.166	101195.200	42134.234
2699019.641	97722.800	39558.159
2692981.376	93845.800	36539.424
2686865.088	89585.000	33100.912
2680677.840	84962.000	29266.160
2674427.234	80002.200	25062.366
2668123.395	74732.800	20518.405
2661774.963	69182.000	15664.037
2655392.081	63380.000	10530.919
2648984.389	57357.600	5151.211

# Slamming

2642562.816	51145.200	443.416
2636138.570	44775.000	6219.570
2629721.335	38278.800	12144.335
2623323.264	31690.600	18182.664
2616954.972	25046.000	24297.972
2610627.336	18383.000	30451.336
2604350.484	11739.000	36604.484
2598135.598	5151.000	42719.598
2591992.305	-1344.000	48758.905
2585931.677	-7711.000	54686.677
2579962.223	-13915.400	60467.623
2574092.896	-19926.000	66069.896
2568332.478	-25711.600	71461.678
2562689.189	-31241.000	76611.189
2557169.675	-36486.000	81489.675
2551779.016	-41420.000	86070.016
2546519.115	-46017.600	90326.315
2541392.300	-50255.000	94234.300
2536399.326	-54111.400	97772.726
2531540.367	-57570.000	100924.367
2526815.019	-60615.000	103673.019
2522221.898	-63233.000	106004.898
2517760.636	-65413.200	107908.836
2513427.286	-67148.800	109377.686
2509220.314	-68433.000	110404.314
2505134.603	-69264.000	110986.603
2501166.851	-69639.600	111122.051
2497312.567	-69562.000	110812.567
2493565.676	-69035.200	110061.876
2489919.714	-68068.000	108878.514
2486369.827	-66669.000	107270.827
2482908.374	-64849.400	105249.774
2479528.324	-62625.000	102830.924
2476222.255	-60012.000	100030.255
2472982.154	-57028.000	96865.154
2469799.618	-53693.800	93356.218
2466666.851	-50031.000	89524.851
2463575.267	-46062.200	85393.467
2460515.485	-41814.200	80988.685
2457479.532	-37312.800	76336.132
2454458.043	-32585.000	71462.643
2451443.257	-27661.000	66398.257
2448425.023	-22570.000	61172.023
2445395.992	-17342.800	55814.592
2442346.822	-12010.600	50357.022
2439270.176	-6603.600	44829.376
2436157.724	-1154.000	39263.724
2433001.138	4307.000	33691.138
2429793.897	9748.600	28142.297
2426527.882	15138.600	22649.282
2423197.380	20448.000	17240.980
2419796.283	25646.200	11947.883
2416318.283	30704.200	6798.883

# Slamming

2412758.280	35594.400	1821.480
2409112.375	40279.000	2946.625
2405374.473	44720.800	7468.327
2401542.282	48897.200	11721.118
2397612.313	52788.800	15685.687
2393582.482	56375.000	19341.518
2389450.104	59638.800	22671.696
2385214.099	62563.200	25659.301
2380873.791	65136.000	28292.209
2376428.904	67344.200	30557.496
2371880.566	69178.800	32446.234
2367228.305	70629.600	33948.295
2362473.855	71692.000	35059.145
2357620.548	72363.400	35776.252
2352670.322	72642.800	36098.678
2347626.714	72530.000	36026.286
2342492.064	72028.200	35562.336
2337272.513	71144.000	34713.487
2331970.606	69882.000	33484.394
2326593.088	68253.000	31885.912
2321143.905	66266.000	29927.095
2315630.005	63935.600	27622.595
2310056.540	61274.000	24984.660
2304430.859	58299.600	22031.741
2298758.516	55028.000	18779.484
2293046.465	51479.800	15248.535
2287302.261	47675.200	11459.139
2281532.862	43636.800	7433.938
2275745.624	39386.800	3195.176
2269947.307	34948.600	1233.707
2264145.871	30347.000	5827.871
2258347.278	25606.800	10562.478
2252560.489	20754.800	15410.689
2246791.469	15816.000	20347.469
2241047.381	10818.000	25345.181
2235335.591	5787.000	30377.591
2229662.664	751.000	35416.664
2224033.769	-4265.600	40437.969
2218456.673	-9235.000	45413.673
2212935.745	-14131.800	50318.345
2207477.954	-18930.400	55126.354
2202087.071	-23608.000	59814.871
2196772.267	-28140.000	64359.267
2191540.314	-32503.000	68736.114
2186398.584	-36676.800	72925.184
2181353.451	-40640.600	76905.651
2176411.289	-44373.800	80656.889
2171577.472	-47859.000	84161.472
2166856.575	-51080.600	87403.775
2162253.175	-54022.000	90367.175
2157771.447	-56670.000	93038.447
2153412.969	-59014.000	95406.969
2149181.718	-61042.200	97460.918

# Slamming

2145078.672	-62747.000	99192.672
2141103.810	-64122.200	100596.010
2137259.311	-65161.000	101664.111
2133544.554	-65861.000	102394.554
2129957.120	-66220.200	102785.320
2126496.889	-66239.300	102837.089
2123161.541	-65919.400	102550.941
2119947.359	-65265.200	101931.559
2116851.424	-64281.200	100983.424
2113870.119	-62975.000	99714.119
2110998.025	-61354.000	98131.025
2108230.927	-59429.200	96245.127
2105562.007	-57213.800	94069.607
2102986.649	-54717.200	91613.849
2100497.438	-51957.000	88895.438
2098088.157	-48946.400	85927.557
2095750.991	-45703.800	82728.591
2093479.327	-42246.000	79315.327
2091263.849	-38592.000	75706.749
2089098.042	-34761.200	71922.242
2086973.194	-30774.100	67982.294
2084880.289	-26652.900	63909.089
2082814.316	-22417.800	59722.816
2080772.661	-18092.000	55446.661
2078751.511	-13698.600	51103.711
2076749.354	-9258.000	46714.354
2074763.377	-4792.400	42300.777
2072789.468	-326.700	37887.868
2070826.716	4119.700	33495.016
2068870.009	8522.700	29146.309
2066918.135	12862.100	24861.935
2064967.784	17116.900	20662.884
2063015.445	21265.800	16570.445
2061059.407	25289.700	12603.707
2059095.360	29168.100	8783.160
2057121.793	32884.000	5125.793
2055135.397	36420.300	1648.697
2053133.862	39759.800	1630.938
2051114.577	42887.200	4697.823
2049075.534	45790.000	7539.466
2047013.323	48453.000	10140.677
2044926.736	50866.600	12491.864
2042813.763	53019.000	14581.237
2040672.396	54902.000	16400.604
2038502.825	56509.200	17943.575
	57835.900	
	58877.000	Max diff
	59628.900	min diff
	60090.200	Max diff In USFOS (ON-OFF)
	60260.400	
	60140.300	
	59732.900	
	59042.000	

# Slamming

	58072.700	
	56831.000	
	55324.900	
	53562.400	
	51553.300	
	49309.000	
	46841.000	
	44162.000	
	41285.900	
	38228.000	
	35003.000	
	31627.800	
	28119.000	
	24493.900	
	20770.700	
	16967.000	
	13103.000	
	9195.700	
	5264.100	
	1328.300	
	-2593.900	
	-6483.000	
	-10321.600	
	-14091.000	
	-17773.900	
	-21352.900	
	-24811.900	
	-28134.000	
	-31305.200	
	-34311.000	
	-37137.000	
	-39772.000	
	-42203.000	
	-44420.800	
	-46414.200	
	-48176.900	
	-49699.800	
	-50977.800	
	-52006.000	
	-52780.700	
	-53299.900	
	-53561.000	
	-53566.000	
	-53315.800	
	-52811.800	
	-52058.100	
	-51060.000	
	-49823.800	
	-48355.800	
	-46664.100	
	-44758.800	
	-42649.000	
	-40347.900	

## Slamming

-37864.700
-35213.200
-32408.000
-29462.700
-26391.000
-23209.100
-19933.100
-16578.100
-13161.300
-9699.700
-6208.900
-2705.100
792.200
4268.100
7706.900
11091.100
14405.000
17633.800
20761.300
23775.000
26659.400
29402.100
31991.000
34413.700
36659.300
38719.400
40584.000
42246.000
43698.700
44934.800
45950.000
46741.000
47305.100
47640.900
47747.300
47626.000
47278.000
46706.200
45914.100
44908.000
43692.600
42274.400
40662.200
38864.700
36890.200
34750.200
32455.200
30017.300
27449.000
24762.400
21972.200
19091.000
16133.800



Slamming

	13114.600	
	10048.200	
	6949.300	
	3834.200	
	716.200	

# Slamming

Engergy: Slam ON	Engergy: Slam OFF + MATLAB
27238.307	29521.491
27236.580	29350.115
27229.710	29202.928
27216.066	29075.078
27196.088	28962.897
27170.228	28863.553
27138.846	28774.833
27102.345	28694.977
27061.087	28622.533
27015.412	28556.267
26965.657	28495.129
26912.209	28438.232
26855.497	28384.819
26795.970	28334.239
26734.071	28285.934
26670.241	28239.416
26604.915	28194.255
26538.506	28150.084
26471.431	28106.587
26404.106	28063.476
26336.961	28020.505
26270.440	27977.466
26204.951	27934.176
26140.828	27890.484
26078.342	27846.260
26017.735	27801.396
25959.232	27755.805
25903.042	27709.429
25849.351	27662.223
25798.341	27614.154
25750.185	27565.193
25705.025	27515.297
25662.950	27464.415
25624.015	27412.506
25588.256	27359.544
25555.677	27305.523
25526.261	27250.438
25499.966	27194.310
25476.741	27137.163
25456.525	27079.029
25439.241	27019.959
25424.807	26960.005
25413.126	26899.232
25404.080	26837.715
25397.526	26775.525
25393.307	26712.753
25391.256	26649.492
25391.190	26585.835
25392.917	26521.882

# Slamming

25396.247	26457.736
25400.990	26393.507
25406.942	26329.300
25413.894	26265.223
25421.622	26201.391
25429.875	26137.912
25438.390	26074.889
25446.910	26012.430
25455.177	25950.640
25462.942	25889.620
25469.962	25829.469
25476.002	25770.276
25480.845	25712.127
25484.270	25655.108
25486.060	25599.294
25486.005	25544.743
25483.885	25491.491
25479.480	25439.557
25472.587	25388.958
25463.027	25339.698
25450.640	25291.777
25435.275	25245.185
25416.806	25199.913
25395.127	25155.940
25370.146	25113.238
25341.790	25071.775
25310.000	25031.507
25274.740	24992.397
25235.991	24954.391
25193.757	24917.427
25148.071	24881.448
25098.972	24846.391
25046.524	24812.183
24990.817	24778.753
24931.945	24746.022
24870.020	24713.909
24805.175	24682.332
24737.551	24651.211
24667.307	24620.454
24594.621	24589.975
24519.672	24559.688
24442.662	24529.507
24363.800	24499.341
24283.300	24469.105
24201.390	24438.714
24118.295	24408.085
24034.250	24377.139
23949.490	24345.794
23864.252	24313.975
23778.779	24281.609
23693.309	24248.626
23608.082	24214.968
23523.335	24180.573

# Slamming

23439.295	24145.383
23356.245	24109.353
23274.511	24072.434
23194.351	24034.584
23115.947	23995.773
23039.472	23955.974
22965.091	23915.163
22892.956	23873.321
22823.205	23830.439
22755.960	23786.513
22691.336	23741.547
22629.433	23695.544
22570.332	23648.511
22514.095	23600.472
22460.767	23551.454
22410.382	23501.485
22362.955	23450.594
22318.480	23398.823
22276.945	23346.216
22238.320	23292.818
22202.560	23238.685
22169.602	23183.870
22139.373	23128.433
22111.783	23072.437
22086.727	23015.947
22064.087	22959.025
22043.732	22901.744
22025.521	22844.176
22009.302	22786.392
21994.918	22728.465
21982.202	22670.466
21970.976	22612.466
21961.057	22554.539
21952.261	22496.760
21944.391	22439.194
21937.251	22381.915
21930.640	22324.991
21924.355	22268.482
21918.200	22212.452
21911.970	22156.962
21905.467	22102.068
21898.503	22047.825
21890.906	21994.297
21882.516	21941.563
21873.186	21889.694
21862.780	21838.760
21851.155	21788.824
21838.180	21739.944
21823.740	21692.170
21807.720	21645.549
21790.015	21600.123
21770.535	21555.922
21749.196	21512.973

# Slamming

		21725.926	21471.302
		21700.661	21430.912
		21673.347	21391.816
		21643.946	21354.019
		21612.421	21317.508
		21578.753	21282.270
		21542.939	21248.292
		21504.978	21215.545
		21464.883	21183.994
		21422.682	21153.608
		21378.405	21124.341
		21332.096	21096.145
		21283.821	21068.965
		21233.636	21042.743
		21181.616	21017.420
		21127.847	20992.928
		21072.417	20969.196
		21015.430	20946.152
		20956.986	20923.716
		20897.197	20901.809
		20836.187	20880.356
		20774.081	20859.267
		20711.021	20838.473
		20647.186	20817.935
		20582.775	20797.621
		20517.980	20777.504
		20452.992	20757.564
		20388.012	20737.764
		20323.237	20718.081
		20258.853	20698.484
		20195.052	20678.941
		20132.016	20659.430
		20069.923	20639.916
		20008.949	20620.374
		19949.262	20600.774
		19891.020	20581.086
		19834.371	20561.286
		19779.457	20541.346
		19726.416	20521.242
		19675.365	20500.951
		19626.415	20480.444
		19579.667	20459.700
		19535.212	20438.702
		19493.130	20417.431
		19453.485	20395.876
2.38E+005	Sum	4716707.478	4848808.020
4.43E+002			
6.01E+004	Diff in Work		132100.542 2.72%

## Slamming





## Slamming





## Slamming

Simple hand Ca		
Slamming [N] 1 m/s	single wire	
Hand [max]	118771.875	
+ submerged weght	2.15E+006 USFOS>Hand	
Slamming/submerged weight ratio	1911652.305	5.85%

Slamming

Slamming

Slamming

Slamming

Slamming

Slamming

## Slamming

Calculations		
Slamming effect [N] from USFOS 1 m/s	Single wire	
Slamming ON [49 - 50] s	1919637	
Slamming OFF [49 - 50] s	1955150.3	
Diff	35513.3	1.82%
Diff form submerged weight	1994910.88	1.75%



Slamming

Slamming

Slamming

Slamming

Slamming

Slamming