

The FV Trident Investigation – Public inquiry - National disgrace

In an earlier post [[link](#)] we gave an overview on how the re-opened Trident casualty investigation (RFI) was being conducted and managed by the Advocate General towards an outcome that would be preferred by at least one of the departments in our current Government (the DfT).

Recently we have learnt that the JPE (the RFI's Joint Panel of Experts) had also taken it upon themselves to rewrite the official records of Trident's intact stability.

Work done:

The JPE have changed the official DOT lightship particulars for Trident (from those used in the original investigation):

Original investigation (OFI) 1975

Lightship displacement¹ = 149.83 tonnes (147.46 imperial tons)
VCG² position = 3.197m above keel (10.487 feet)
LCG³ position = 9.971m forward of the rudder stock (3.525 feet aft of amidships)

Re-opened investigation (RFI) 2010

Lightship displacement = 153.01 tonnes
VCG position = 3.18m above keel
LCG position = 9.95m forward of the rudder stock

They have also modified the weights of the items that she was assumed to be carrying on the day of her last voyage (*the original figures can be seen in the NMI/Morrall testing report [[link](#)] page 13 and in the report of the original investigation [[link](#)] - condition A2*):

- They increased the amount of fuel she was carrying by 1.75 tonnes to 6.75 tonnes
- They doubled the amount of fresh water on board to 3 tonnes
- They reduced the amount of stores in the upper focsle space from 1.5 tonnes to 0.45 tonnes and removed 1 tonne of stores from the lower focsle space
- They reduced the weight of the fish boxes in the hold from 3.37 tonnes to 2.4 tonnes
- They reduced the weight of the lube oil drums in the engine room by 20kg
- They reduced the weight of fishing nets from 3.6 tonnes to 3 tonnes
- They increased the weight of the gallows chain from 0.27 to 0.45 tonnes
- They removed the 'dog rope'
- They increased the amount of engine room stores by 100kg
- They increased the amount allowed for the crew's effects by 90kg

The cumulative effect of all these JPE modifications may be seen when Trident's final sailing condition for the 2010 RFI is compared to that of the 1975 OFI:

Original investigation (OFI) 1975

Sailing displacement⁴ at the time of loss = 167.6 tonnes
VCG position = 3.161m above keel
LCG position = 10.248m forward of the rudder stock

Re-opened investigation (RFI) 2010

Sailing displacement at the time of loss = 170.4 tonnes
VCG position = 3.126m above keel
LCG position = 10.02m forward of the rudder stock

In brief, the effect of the JPE's modifications has been to increase Trident's notional stability reserves by about 10% for her final sailing and loss condition.

¹ Lightship displacement = the floating weight of the empty ship

² VCG = the position of the vertical centre of gravity of the ship's weight

³ LCG = the position of the longitudinal centre of gravity of the ship's weight

⁴ Sailing displacement = the floating weight of the ship plus crew, fuel, water, gear, stores etc

Note: In 1975, the Court's experts carried out a very comprehensive and careful investigation into Trident's stability characteristics - in terms of ascertaining her empty hull weight, position of centre of gravity and the items of fishing gear, fuel, water and stores she was carrying onboard at the time of her loss. There is no substantive reason or factual basis to justify the changes that have now been carried out by the JPE.

If we look at the stability of the Trident in both the original and the JPE-modified conditions we can see that in her original condition, Trident is clearly non-compliant with IMCO minimum stability criteria, however, after the JPE modifications have been applied, her stability improves to the point where she only marginally fails to meet the IMCO minima:

Trident's stability reserves - as determined by experts for the original (1975) investigation

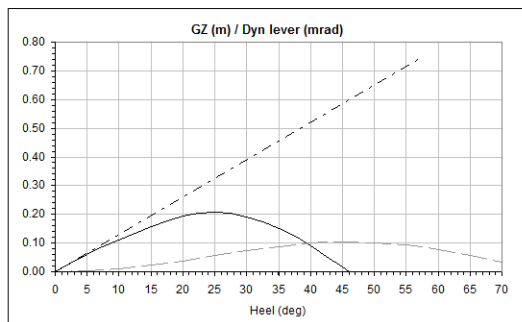
Loading condition: Estimated condition at time of loss - OFI -1975
 Dens SW = 1.025 ton/m³
 Displacement SW (ton): 167.59
 LCG fw AP (m): 10.248
 TCG ps CL (m): 0.000
 KG (m): 3.162
GMo' (m): 0.745

Free trim stability:	Right lever	Dyn. lever	Incr. stab	Draught	Trim	(No of
Heel a (°)	GZ (m)	GZa(0-a)	dGZ/da	mid at L/2	at CL	iterations)
0	0.000	0.000	0.745	2.322	0.701	5 (2)
5	0.060	0.003	0.631	2.316	0.681	3 (4)
10	0.112	0.010	0.554	2.300	0.633	3 (4)
15	0.157	0.022	0.486	2.274	0.570	3 (4)
20	0.196	0.037	0.340	2.237	0.500	3 (4)
25	0.209	0.055	-0.030	2.195	0.436	3 (4)
30	0.192	0.073	-0.344	2.153	0.383	3 (4)
35	0.151	0.088	-0.600	2.112	0.341	3 (4)
40	0.090	0.099	-0.799	2.070	0.311	3 (3)
45	0.016	0.103	-0.885	2.024	0.286	3 (4)
50	-0.064	0.101	-0.913	1.969	0.262	3 (4)
55	-0.140	0.092	-0.804	1.888	0.211	4 (3)
60	-0.203	0.077	-0.628	1.764	0.167	4 (3)
65	-0.249	0.057	-0.408	1.570	0.100	3 (4)
70	-0.272	0.034	-0.188	1.257	-0.062	4 (4)

GZmax at 24.6°: 0.209

Stability criteria:	Actual value / Compliance	Max KG (m)	Crit. Points:	Subm. angle (°)
GZa(0°-30.0°)>0.055mrad	0.073 / OK	3.296		
GZa(0°-40.0°)>0.090mrad	0.099 / OK	3.199		
GZa(30.0°-40.0°)>0.030mrad	0.028 / NO	3.119		
GZi>30.0°>0.200m	0.192 / NO	3.146		
a(GZmax)>25.0°	24.6 / NO	3.128		
GMo>0.350m	0.745 / OK	3.557		

Sum. Compliance, max KG': NO 3.119 Min. angle:



Trident's stability reserves - as determined by experts for the re-opened (2010) investigation

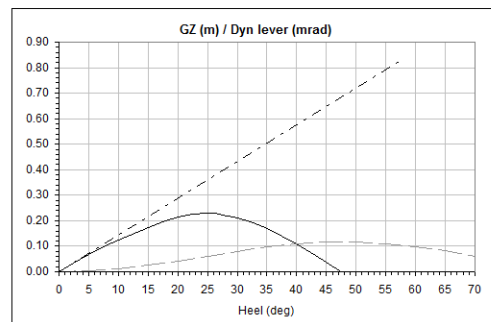
Loading condition: Estimated condition at time of loss - RFI - 2010
 Dens SW = 1.025 ton/m³
 Displacement SW (ton): 170.40
 LCG fw AP (m): 10.029
 TCG ps CL (m): 0.000
 KG (m): 3.126
GMo' (m): 0.825

Free trim stability:	Right lever	Dyn. lever	Incr. stab	Draught	Trim	(No of
Heel a (°)	GZ (m)	GZa(0-a)	dGZ/da	mid at L/2	at CL	iterations)
0	0.000	0.000	0.825	2.329	0.898	5 (2)
5	0.068	0.003	0.706	2.324	0.882	3 (4)
10	0.125	0.012	0.608	2.309	0.841	3 (4)
15	0.175	0.025	0.535	2.284	0.787	3 (4)
20	0.216	0.042	0.334	2.249	0.726	3 (4)
25	0.229	0.061	-0.038	2.211	0.680	3 (4)
30	0.211	0.081	-0.349	2.174	0.652	3 (3)
35	0.170	0.098	-0.598	2.137	0.643	3 (3)
40	0.110	0.110	-0.787	2.100	0.650	4 (3)
45	0.038	0.116	-0.838	2.059	0.676	4 (3)
50	-0.036	0.116	-0.856	2.003	0.673	4 (3)
55	-0.109	0.110	-0.787	1.926	0.647	4 (3)
60	-0.169	0.098	-0.584	1.806	0.630	4 (3)
65	-0.209	0.081	-0.342	1.614	0.605	4 (3)
70	-0.231	0.062	-0.225	1.308	0.533	4 (3)

GZmax at 24.5°: 0.229

Stability criteria:	Actual value / Compliance	Max KG (m)	Crit. Points:	Subm. angle (°)
GZa(0°-30.0°)>0.055mrad	0.081 / OK	3.318		
GZa(0°-40.0°)>0.090mrad	0.110 / OK	3.211		
GZa(30.0°-40.0°)>0.030mrad	0.029 / NO	3.117		
GZi>30.0°>0.200m	0.211 / OK	3.149		
a(GZmax)>25.0°	24.5 / NO	3.084		
GMo>0.350m	0.825 / OK	3.601		

Sum. Compliance, max KG': NO 3.084 Min. angle:



A comparison of these two sets of results reveals that Trident's stability reserves appear to have 'grown' by approximately 10% in the 36 years since her loss

Tank testing of the modified Trident

If we then consider the next stage in the proceedings, the model testing that was carried out in 2006 at the MARIN Testing tank in Holland, we can note that this was carried out in wave conditions that were more severe than those recorded at the original 1975 inquiry (and those which were used during the NMI/Morrall model testing in 1976).

So why was it necessary to use bigger waves in 2006?

Don't forget that as the JPE had increased the notional stability reserves of Trident by about 10% (and thus those of the model they were testing) the model wouldn't have capsized in the more moderate wave conditions that were used to obtain capsizes in the NMI/Morrall tests. To obtain a capsized in the 2006 tests it was therefore necessary to employ bigger waves hence the services of two weather hind-cast experts were engaged by the JPE to provide modified weather data – data that the JPE could then use to justify the more severe test conditions that were required for the model to capsize in the MARIN tests!

And what were the motives behind the JPE's actions?

1. To 'update' our official records to indicate that, contrary to the evidence contained in the report of the 1975 formal investigation and in the 1976 NMI/Morrall report, the Trident's stability at the time of her loss 'complied substantially with IMCO⁵' minimum standards, and that, therefore, non-compliance was not a factor in her loss.

RFI Transcript for 12 July 2010 – Advocate General page 102:

6	"There is no reliable evidence to support a
7	finding that the loss of the Trident was
8	caused by a deficiency in her design,
9	stability as measured by the extent of
10	compliance or non-compliance with the
11	recommended IMCOs intact stability criteria.

2. To 'update' our official records to show that on 3rd October 1974, the sea and weather conditions were more severe than thought at the time of the 1975 investigation and as used in the NMI/Morrall model tests

RFI Transcript for 12 July 2010 – Advocate General page 50:

3	testing. There are three sources of
4	evidence before the RFI concerning the sea
5	conditions experienced by the Trident at the
6	RFI. Firstly there is the evidence from the
7	OFI which included Dr Draper's assessment,
8	and the evidence from the crew of the
9	Faithful II, all of which is recorded in the
10	transcripts of the OFI. Secondly there is
11	the evidence from the crew members of the
12	Faithful II from Messrs Wood, Reid and
13	Ritchie to the RFI, only Mr Reid had not
14	previously given evidence to the OFI.
15	Thirdly there is the scientific evidence
16	contained in the Hindcast Report from AMI
17	and FUGRO GEUS, it is the Hindcast Report
18	that represents new evidence so far as the
19	RFI is concerned. There are numerous

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7	Lord, in the JPE Report. The new evidence
8	in the prevailing weather and sea conditions
9	leads to significantly different conclusions
10	to those arrived at by the Court of the OFI.

3. To show by means of model testing that the modified Trident could capsize in these revised sea and weather conditions - even when her stability complied substantially with IMCO minimum standards

⁵ This was the stated position of the DOT throughout the 1975 Formal Investigation

22 | And then it says, "It is
23 | interesting to note that also on the lowest
24 | wave condition realised where the
25 | significant wave height is 4.58 metres,
1 | capsizing is observed".

Note the significant wave height used in the 1976 NMI/Morrall model tests was only 3.2m. - Trident's original stability reserves were insufficient to prevent capsizing in these, more modest sea conditions

4. To request the Sheriff to dismiss the conclusions from the original 1975 formal investigation and the subsequent model tests carried out NMI/Morrall in 1976
RFI Transcript for 12 July 2010:

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1 | **SHERIFF PRINCIPAL YOUNG:** Thank you.
2 | Presumably, I mean there is another, from
3 | what you say, as I understand it and what
4 | many of the others are saying, there is
5 | another pretty fundamental difference
6 | between what this Court is being asked to
7 | do as opposed to the, in contrast to the
8 | conclusion which was reached by the OF in
9 | the Report following the OFI which they
10 | said that, I think that the exact wording
11 | was probable that deficiency in this stability
12 | of the vessel contributed to the loss.
13 | **MS WILSON:** Indeed my Lord.
14 | **SHERIFF PRINCIPAL YOUNG:** Whereas I
15 | think from what you are saying is that you
16 | are now inviting me effectively to say I
17 | don't agree with that.
18 | **MS WILSON:** I do, my Lord. I am obliged.

5. And finally to enable the Sheriff to conclude:

3 | that the most
4 | probable cause of the loss of the Trident is
5 | a sudden and catastrophic capsizing, which is
6 | attributed to the specific seakeeping
7 | characteristics of the vessel, combined with
8 | the estimated loading conditions at the time
9 | of loss and the prevailing sea conditions.

Our conclusion

The callous way in which the current investigation into the tragic loss of the Trident and her seven crew members has been scripted by the DfT and conducted by the AG towards a pre-determined outcome reveals the depths that our Government, and those it employs, will stoop in order to maintain policies that, regardless of their warped perception of the public interest, they know are both unjust and unlawful.

This is nothing less than a national disgrace