Ship's description (LNG203g1)

145.000 m3 LNG-Carrier(Ballast)

LxBxT=290(276.0)x46.0x9.50 m³

Jan 1999

14649.682

Ship's description, 135.000 m³ LNG-CARRIER (T=9.5 m)
LNG203g

Contents

A. GENERAL DATA file:Lng203g1

1. Ship's dimensions and data

Ship's type	-	LNG carrier
Length over all	[m]	290.0
Length between perpendiculars	[m]	276.0
Beam	[m]	46.0
Depth	[m]	25.0
Draught amid ship's	[m]	9.5
Draught forward	[m]	9.5
Draught after	[m]	9.5
Displacement	[tons]	85.000
Cargo capacity	[m^3]	145.000
Engine type	[-]	Turbine
Power	[kW]	33120.
Number of revolutions	[rpm]	68.
Service speed	[kts]	20.0
Number of propellers	[-]	1
Diameter of propellers	[m]	7.70
Pitch ratio	[-]	1.3
Number of rudders	[-]	1
Frontal wind area	[m^2]	1620.
Lateral wind area	[m^2]	8150.

2. Wind coefficients

Alpha [deg]	Cx [-]	Cy [-]	Cn [-]
0.00	.4500	.0000	.0000
10.00	.5000	.1300	-.0500
20.00	.5600	.3100	-.0880
30.00	.5300	.4900	-.1150
40.00	.4800	.6200	-.1180
50.00	.5000	.6700	-.0930
60.00	.3000	.7500	-.0810
70.00	.1700	.7900	-.0630
80.00	.0500	.8300	-.0450
90.00	.0000	.8400	-.0260
100.00	-.0700	.8300	-.0030
110.00	-.2500	.8200	.0070
120.00	-.4000	.7800	.0200
130.00	-.5800	.7000	.0330
140.00	-.6000	.5800	.0370
150.00	-.7600	.4300	.0360
160.00	-.7800	.2600	.0300
170.00	-.6500	.1000	.0160
180.00	-.5700	.0000	.0000

3. Wave Coefficients

The wave coefficients have been calculated with the MARIN program DBSHIP.
All computations have been made assuming a JONSWAP wave spectrum and a water depth of 25 m.

File: fer027t5.wav
Tp = 5 s, Tmean = 3.54 s

File: fer027t7.wav
Tp = 7 s, Tmean = 4.95 s

Alfa [deg]	X-Force [N]	Y-Force [N]	Moment [Nm]	X-Force [N]	Y-Force [N]	Moment [Nm]
0	6.30E+03	0.00E+00	0.00E+00	6.40E+03	0.00E+00	0.00E+00
10	6.30E+03	5.70E+03	-1.00E+02	6.50E+03	6.00E+03	-2.01E+04
20	6.60E+03	1.31E+04	-2.00E+02	6.80E+03	1.40E+04	-3.44E+04
30	6.90E+03	2.22E+04	-3.00E+02	7.10E+03	2.44E+04	-3.16E+04
40	7.50E+03	3.32E+04	-4.00E+02	7.70E+03	3.67E+04	-3.82E+04
50	9.00E+03	4.79E+04	-7.00E+02	9.30E+03	5.24E+04	-8.44E+04
60	1.04E+04	6.39E+04	-1.10E+03	1.09E+04	6.88E+04	-1.54E+05
70	1.05E+04	7.87E+04	-1.30E+03	1.10E+04	8.36E+04	-2.10E+05
80	5.90E+03	8.64E+04	-1.20E+03	6.10E+03	9.12E+04	-1.81E+05
90	0.00E+00	8.92E+04	-8.00E+02	-2.00E+02	9.37E+04	-1.16E+05
100	-5.90E+03	8.64E+04	-2.00E+02	-6.20E+03	9.08E+04	-1.44E+04
110	-1.05E+04	7.87E+04	4.00E+02	-1.07E+04	8.30E+04	6.99E+04
120	-1.04E+04	6.39E+04	4.00E+02	-1.06E+04	6.83E+04	4.95E+04
130	-9.00E+03	4.79E+04	2.00E+02	-9.20E+03	5.21E+04	1.01E+04
140	-7.50E+03	3.32E+04	1.00E+02	-7.70E+03	3.66E+04	-1.33E+04
150	-6.90E+03	2.22E+04	0.00E+00	-7.20E+03	2.45E+04	-2.70E+03
160	-6.60E+03	1.31E+04	0.00E+00	-6.80E+03	1.42E+04	1.32E+04
170	-6.30E+03	5.70E+03	0.00E+00	-6.60E+03	6.10E+03	1.08E+04
180	-6.30E+03	0.00E+00	0.00E+00	-6.50E+03	0.00E+00	0.00E+00

File: fer27t10.wav
Tp = 10 s, Tmean = 7.07 s

Alfa [deg]	X-Force [N]	Y-Force [N]	Moment [Nm]
0	9.00E+03	0.00E+00	0.00E+00
10	9.70E+03	7.90E+03	-1.72E+05
20	1.03E+04	2.03E+04	-2.83E+05
30	1.03E+04	3.93E+04	-2.41E+05
40	1.09E+04	5.99E+04	-2.64E+05
50	1.46E+04	8.04E+04	-6.06E+05
60	1.87E+04	9.83E+04	-1.12E+06
70	2.00E+04	1.15E+05	-1.51E+06
80	8.50E+03	1.33E+05	-1.12E+06
90	-4.70E+03	1.42E+05	-4.84E+05
100	-1.14E+04	1.31E+05	1.76E+05
110	-1.48E+04	1.13E+05	6.59E+05
120	-1.40E+04	9.62E+04	4.64E+05
130	-1.20E+04	7.90E+04	1.50E+05
140	-1.04E+04	5.93E+04	-3.64E+04
150	-1.02E+04	3.93E+04	2.48E+04
160	-1.02E+04	2.07E+04	1.27E+05
170	-9.70E+03	8.30E+03	9.36E+04
180	-9.00E+03	0.00E+00	0.00E+00

4. Ship information sheet

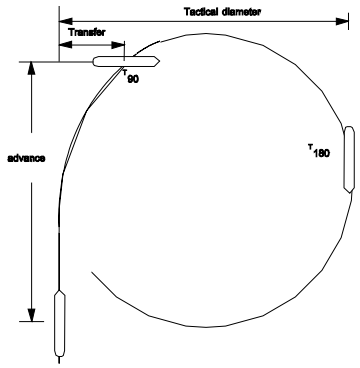
Main dimensions		Engine	
Length over all	290.0 m	Type	Steam Turbine
Beam	46.0 m	Power	33,120 kW
Draft fully laden	11.67m	max. revs	80 rpm
Displacement	114,800 tons		
Cargo Capacity	135,000 m³		

Telegraph	rpm	speed kn	Crash stop		
			distance	time	
SEA FULL	80	18.4	mile	min	sec
HARBOUR FULL	50	11.5			
HALF	40	9.2	1.46	7	36
SLOW	30	6.9			
DEAD SLOW	20	4.6			

Turning circles						
Telegraph	Rudder	ADVANCE	TRANSFER	TIME		TACT. DIAM.
		mile	mile	min	sec	mile
SEA FULL	SB	0.50	0.24	2	18	0.50
	P	0.49	0.23	2	23	0.49
HALF	SB	0.49	0.24	3	20	0.50
	P	0.48	0.23	3	18	0.49

WARNING:
The response of this ship may be different from that listed above if any of the following conditions upon which the manoeuvring information is based are varied:

1. Calm weather - wind 8 knots or less, calm sea.
2. No current.
3. Water depth twice vessels draft or greater.
4. Clean hull.
5. Load condition FULL LOAD



5. Autopilot Coefficients

s Anticipation distance	[-]	0.50	1.00	1.50	2.00
A coefficient rudder	[-]	1.00	1.00	1.00	1.00
B coefficient rudder rate	[-]	0.00	0.00	0.00	0.00
C course angle gain	[-]	18.97	9.48	6.32	4.74
D cross track distance gain	[-]	22.50	5.62	2.50	1.41
E yaw gain	[-]	5.51	5.51	5.51	5.51
F cross current gain	[-]	18.97	9.48	6.32	4.74
G yaw acceleration	[-]	0.00	0.00	0.00	0.00
H constant rudder	[deg]	0.00	0.00	0.00	0.00

B. RESULTS OF MANOEUVRING TESTS, TABLES AND PLOTS

1.1 Turning circle test :

Waterdepth = 11.40

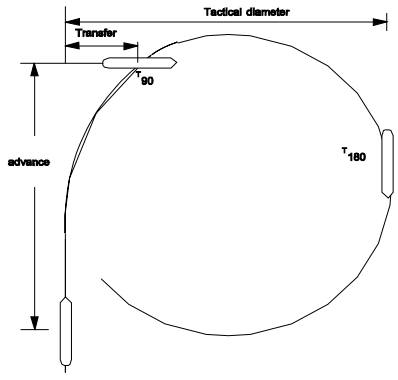
INPUT:

Initial speed	[m/s]	6.17
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	20.0

RESULTS:

		Port	Starboard
Advance	[m]	1455.	-
Transfer	[m]	1117.	-
Tactical diam.	[m]	2230.	-
Final diam.	[m]	2143.	-
T_{90}	[s]	355.	-
T_{180}	[s]	661.	-
T_{270}	[s]	966.	-
u_f	[m/s]	5.52	5.52
v_f	[m/s]	0.14	-0.14
r_f	[°/s]	-0.2952	0.2952

See also Figure 1.1



1.2 Turning circle test :

Waterdepth 1 = 11.40

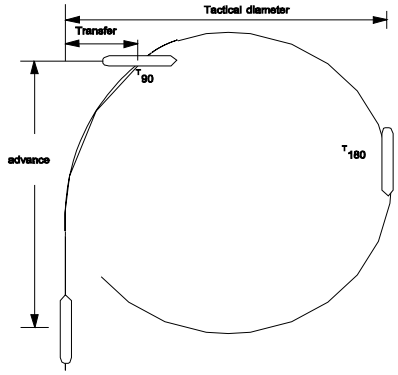
INPUT:

Initial speed	[m/s]	6.17
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	35.0

RESULTS:

		Port	Starboard
Advance	[m]	1061.	-
Transfer	[m]	710.	-
Tactical diam.	[m]	1404.	-
Final diam.	[m]	1261.	-
T_{90}	[s]	265.	-
T_{180}	[s]	485.	-
T_{270}	[s]	705.	-
u_f	[m/s]	4.49	4.49
v_f	[m/s]	0.22	-0.22
r_f	[°/s]	-0.4086	0.4086

See also Figure 1.2



1.3 Zig zag test

Waterdepth 1 = 11.40

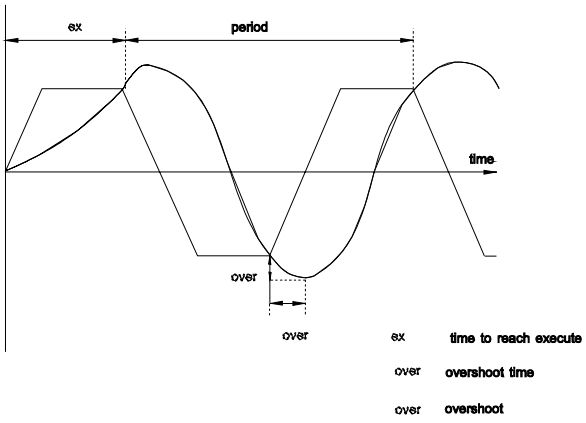
INPUT:

Initial speed	[m/s]	6.17
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	20/20

RESULTS:

T_{ex}	[s]	112.
T_{over}	[s]	39.
Ψ_{over}	[deg]	6.1

See also Figure 1.3 and 1.4



1.4 Stopping manoeuvre

Waterdepth 1 = 11.40

INPUT:

Initial speed	[m/s]	6.17
Numbers of revolutions ahead	[1/s]	0.83
Numbers of revolutions astern	[1/s]	-0.83

RESULTS:

Stopping length	[m]	652.
Stopping time	[s]	205.
Heading after stopping	[deg]	8.0

See also Figure 1.5 and 1.6

1.5 Acceleration test

Waterdepth 1 = 11.40

INPUT:

Initial speed	[m/s]	0.0
Numbers of revolutions ahead	[1/m]	50.

RESULTS:

Acceleration distance	[m]	4786.
Acceleration time	[s]	965.
Final speed	[m/s]	6.13

See also Figure 1.7

1.6 Spiral test

Waterdepth 1 = 11.40

INPUT:

Initial speed	[m/s]	6.17
Numbers of revolutions ahead	[1/s]	0.83
Rate of turn	[deg/s]	-0.41 - 0.41

RESULTS: see Fig. 1.8

2.1 Turning circle test :

Waterdepth = 19.00

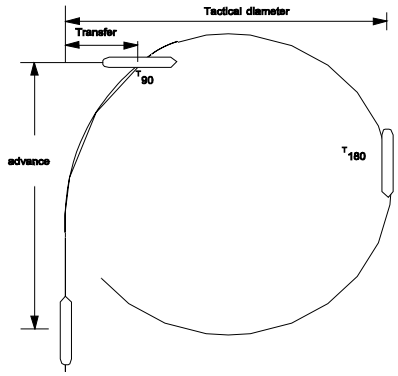
INPUT:

Initial speed	[m/s]	7.25
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	20.0

RESULTS:

		Port	Starboard
Advance	[m]	1073.	-
Transfer	[m]	571.	-
Tactical diam.	[m]	1197.	-
Final diam.	[m]	941.	-
T_{90}	[s]	208.	-
T_{180}	[s]	381.	-
T_{270}	[s]	564.	-
u_f	[m/s]	3.83	3.83
v_f	[m/s]	0.77	-0.77
r_f	[°/s]	-0.4782	0.4782

See also Figure 2.1



2.2 Turning circle test :

Waterdepth 1 = 19.00

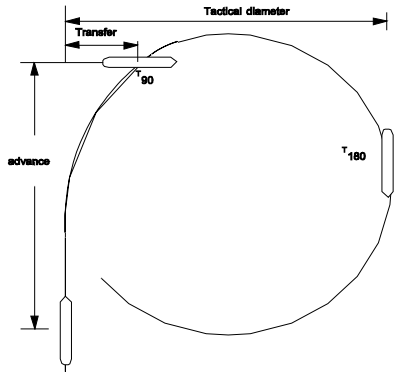
INPUT:

Initial speed	[m/s]	7.25
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	35.0

RESULTS:

		Port	Starboard
Advance	[m]	939.	-
Transfer	[m]	461.	-
Tactical diam.	[m]	967.	-
Final diam.	[m]	645.	-
T_{90}	[s]	189.	-
T_{180}	[s]	352.	-
T_{270}	[s]	527.	-
u_f	[m/s]	2.65	2.65
v_f	[m/s]	0.79	-0.79
r_f	[°/s]	-0.4967	0.4967

See also Figure 2.2



2.3 Zig zag test

Waterdepth 1 = 19.00

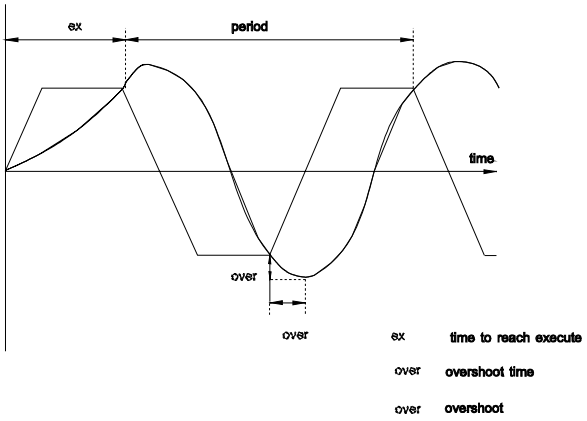
INPUT:

Initial speed	[m/s]	7.25
Numbers of revolutions	[1/s]	0.83
Rudder angle	[deg]	20/20

RESULTS:

T_{ex}	[s]	76.
T_{over}	[s]	79.
Ψ_{over}	[deg]	19.8

See also Figure 2.3 and 2.4



2.4 Stopping manoeuvre

Waterdepth 1 = 19.00

INPUT:

Initial speed	[m/s]	7.25
Numbers of revolutions ahead	[1/s]	0.83
Numbers of revolutions astern	[1/s]	-0.83

RESULTS:

Stopping length	[m]	852.
Stopping time	[s]	228.
Heading after stopping	[deg]	14.1

See also Figure 2.5 and 2.6

2.5 Acceleration test

Waterdepth 1 = 19.00

INPUT:

Initial speed	[m/s]	0.0
Numbers of revolutions ahead	[1/m]	50.

RESULTS:

Acceleration distance	[m]	4772.
Acceleration time	[s]	945.
Final speed	[m/s]	7.03

See also Figure 2.7

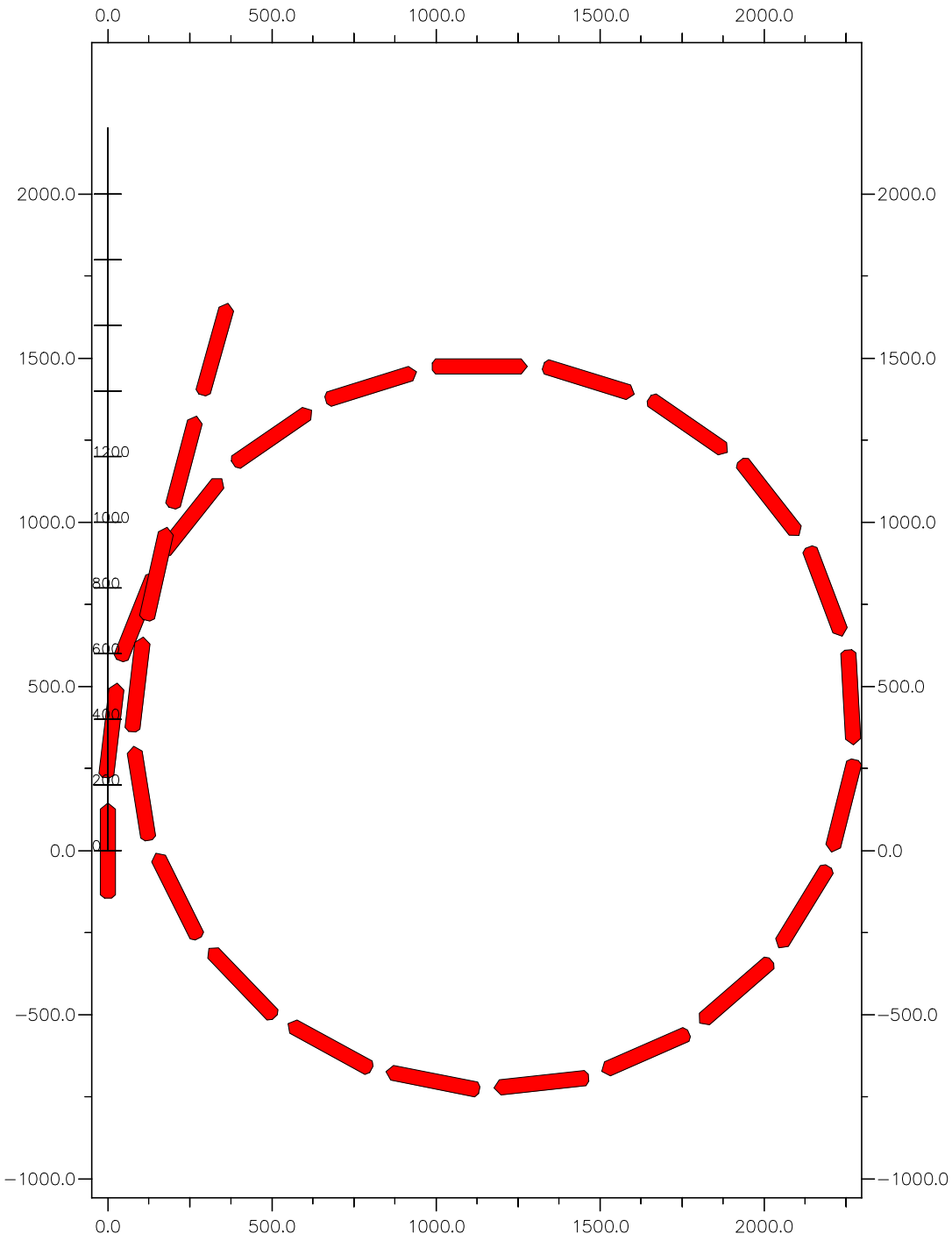
2.6 Spiral test

Waterdepth 1 = 19.00

INPUT:

Initial speed	[m/s]	7.25
Numbers of revolutions ahead	[1/s]	0.83
Rate of turn	[deg/s]	-0.49 - 0.49

RESULTS: see Fig. 2.8

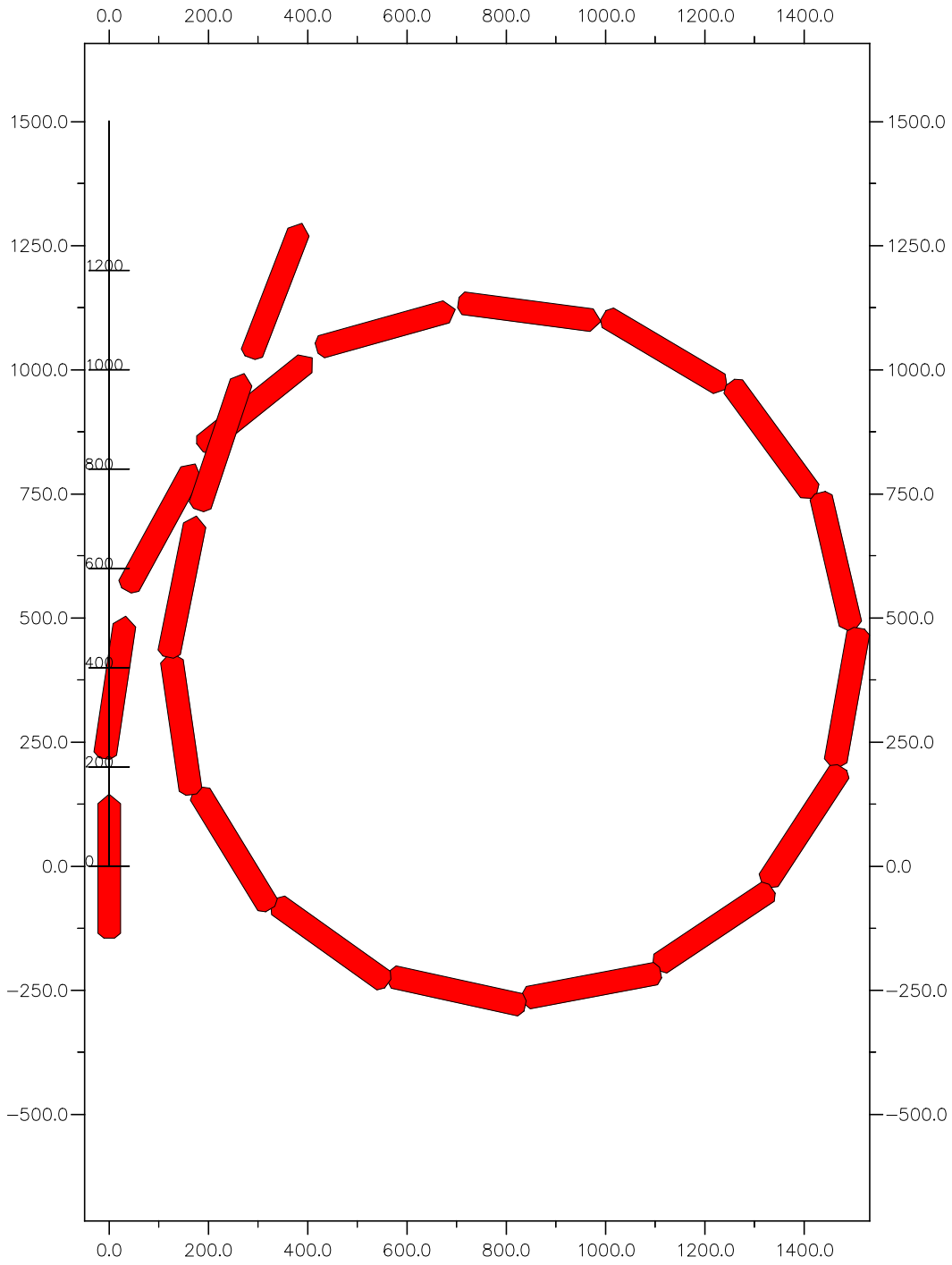


Turning Circle (20 deg) h/T=1.2
LNGCarrier, Lpp=276.0m, T=9.5m

Plotinterval 60s

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.1

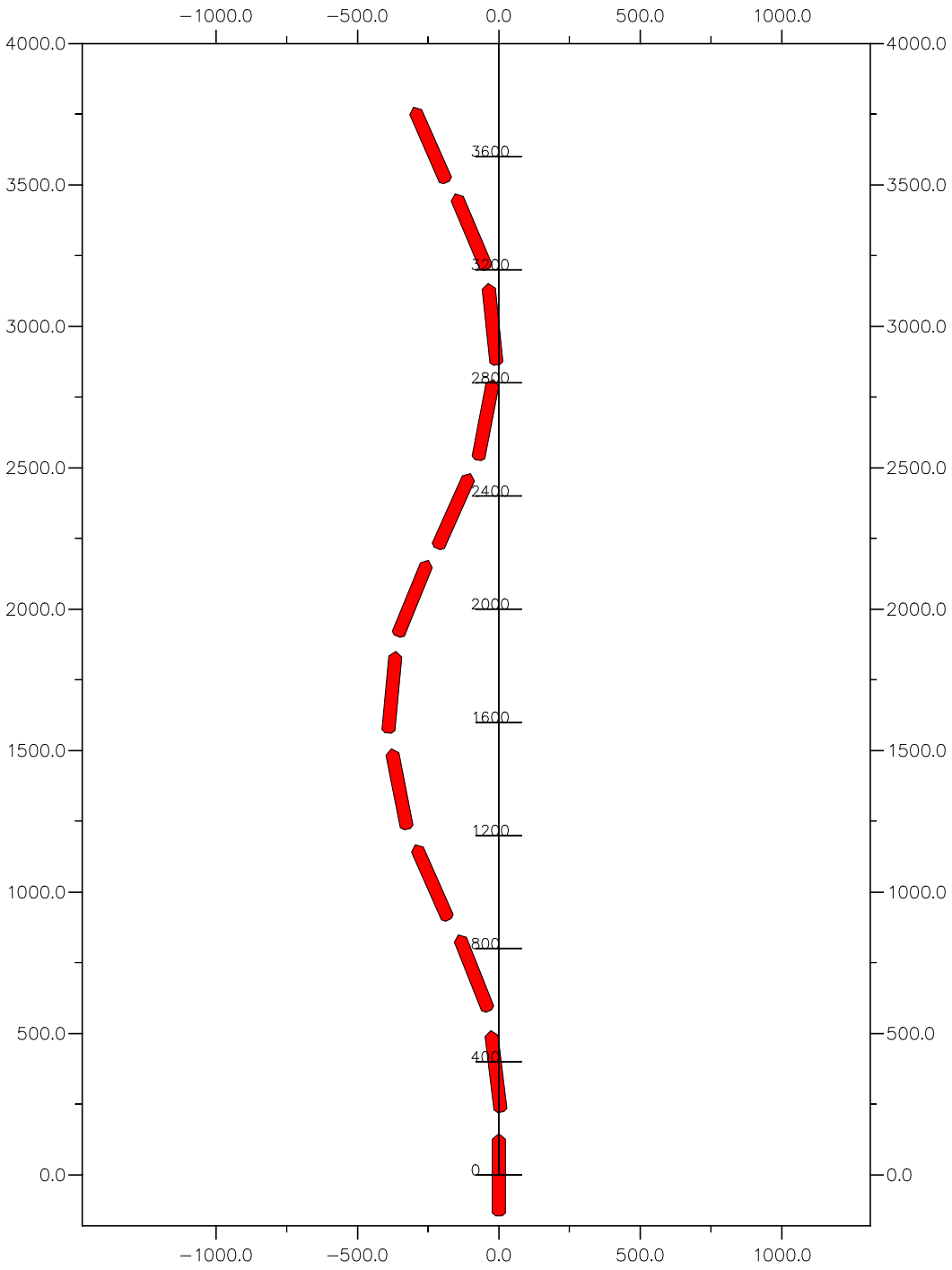


TURNING CIRCLE (35 deg) h/T=1.2
LNGCarrier, Lpp=276.0m, T=9.5m

Plotinterval 60 s.

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.2

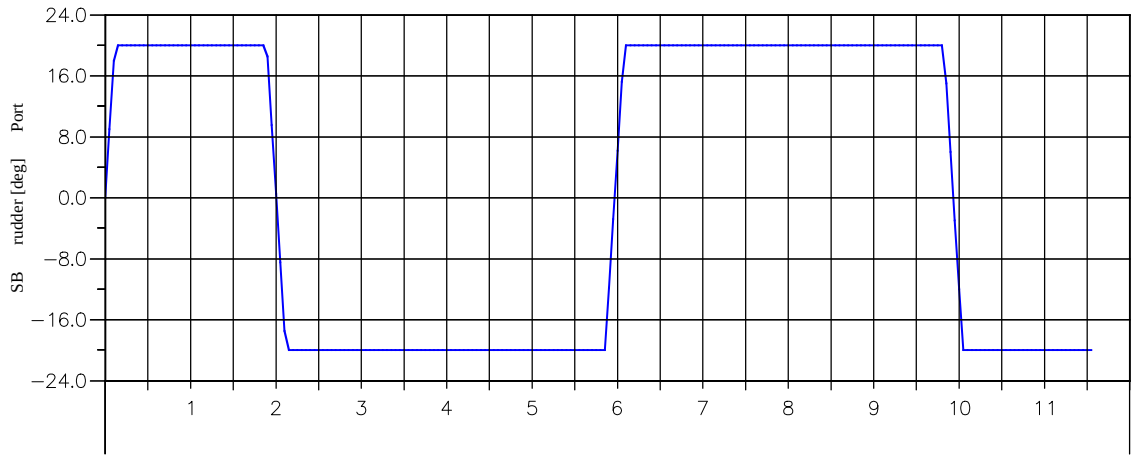


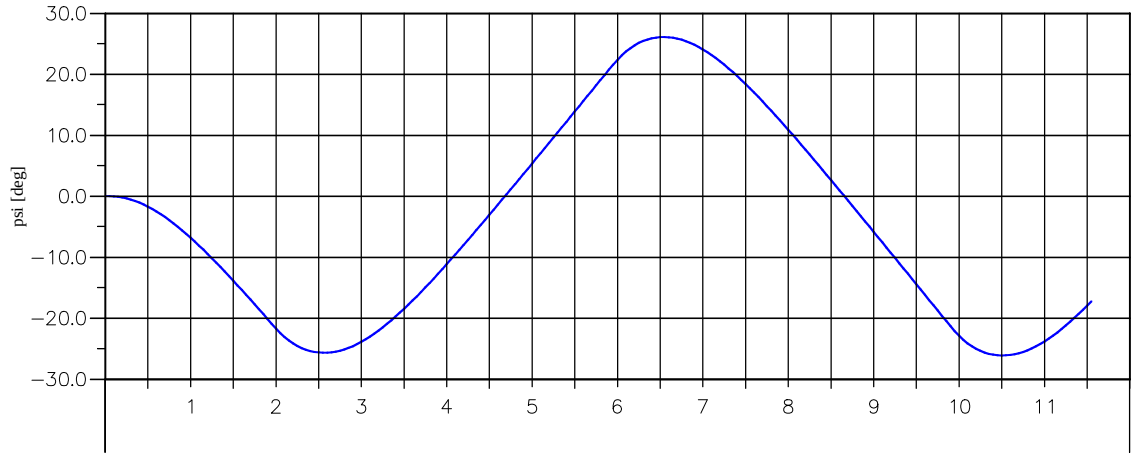
Zigzag Manouevre 20/20 deg, h/T=1.2
LNGCarrier, Lpp=276.0m, T=9.5m

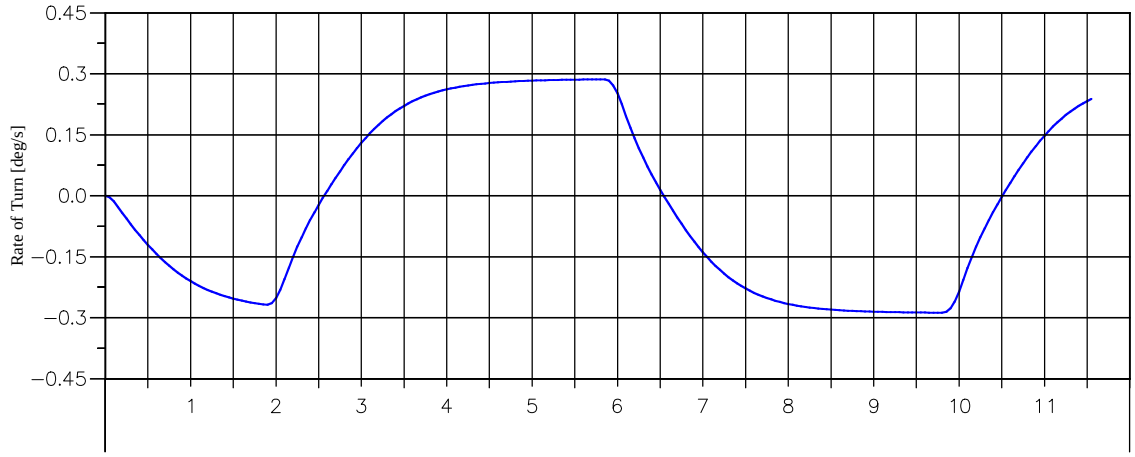
Plotinterval 60s.

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.3







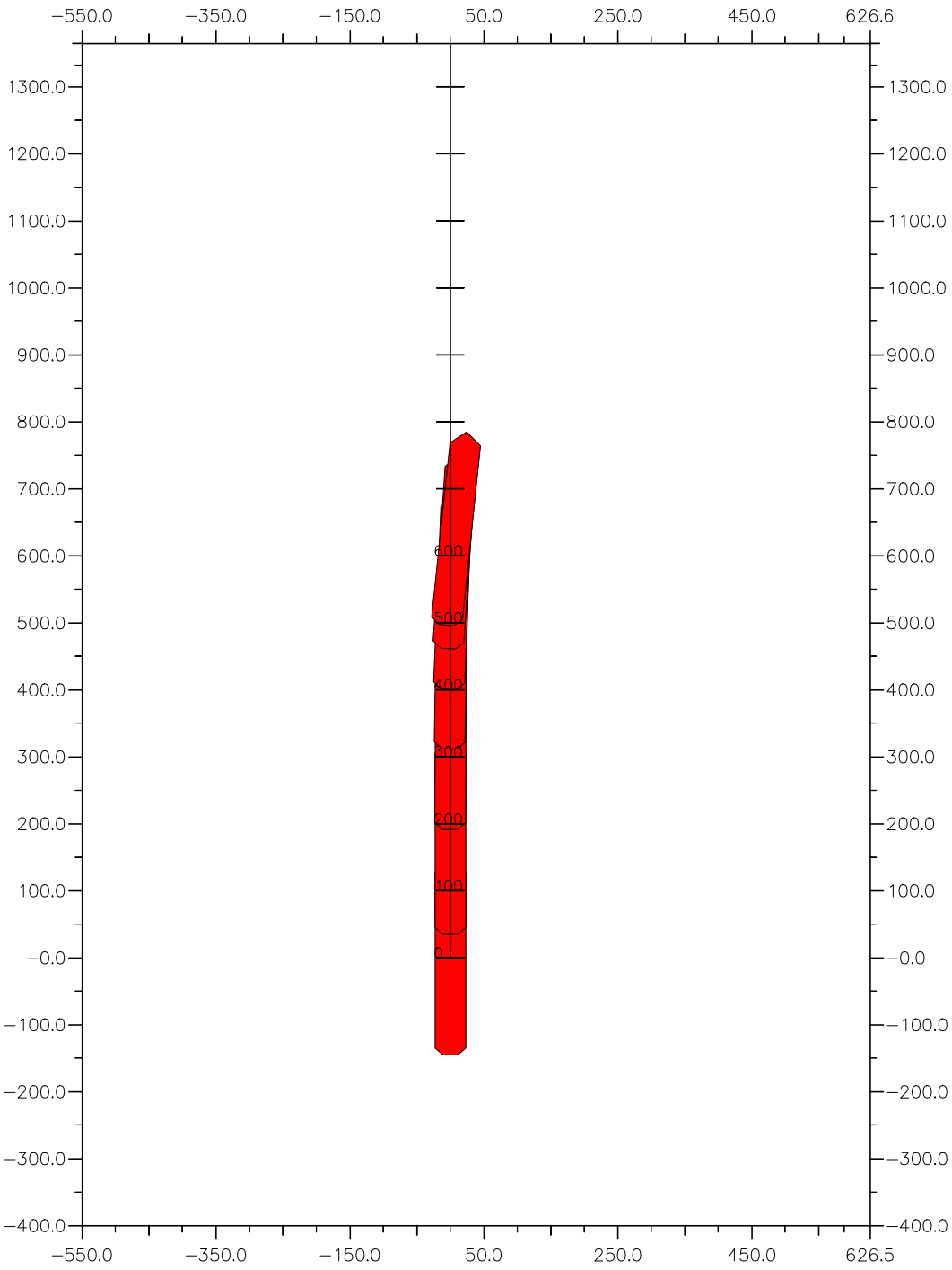
Zigzag Manoeuvre 20/20 deg, h/T=1.2

LNGCarrier, Lpp=276.0m, T=9.5m

Time in minutes

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.4

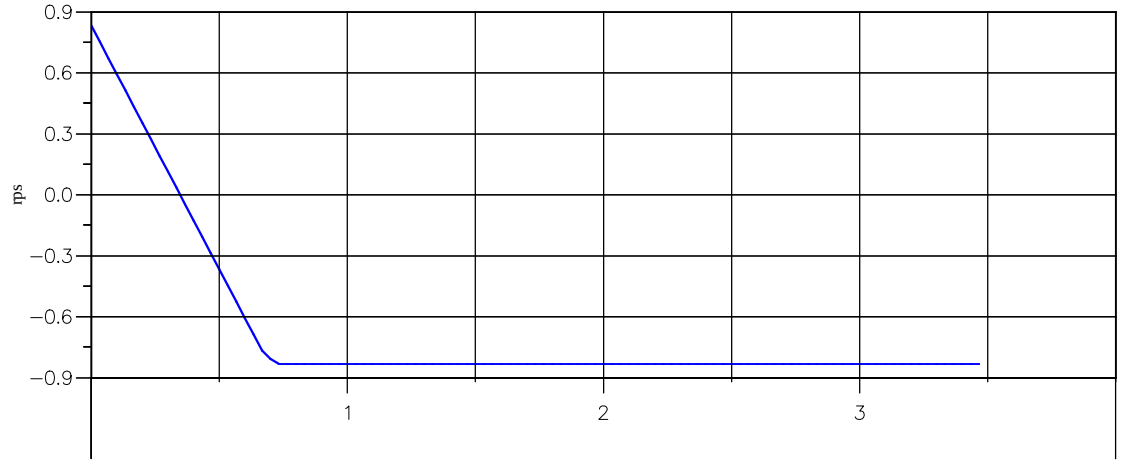


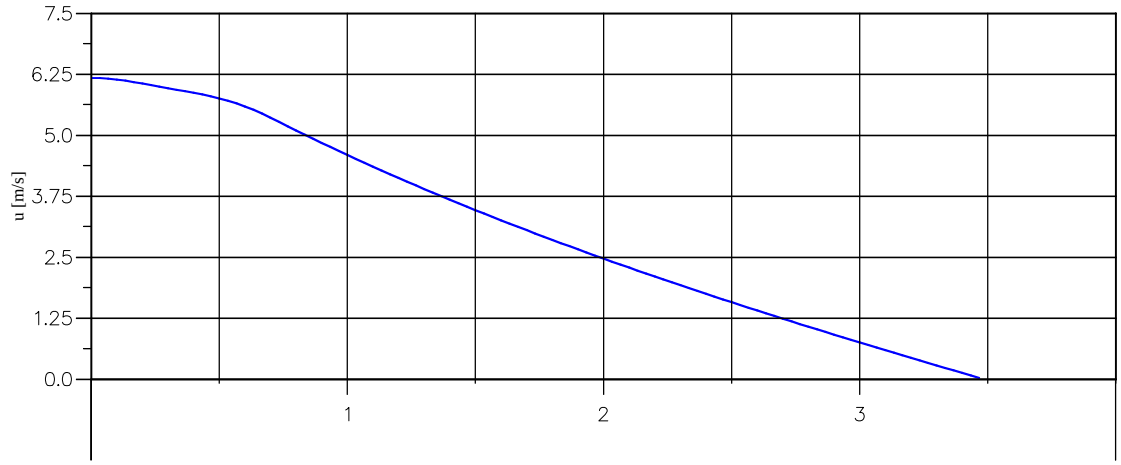
STOPPING MANOEUVRE, h/T = 1.2
LNGCarrier, Lpp=276.0m, T=9.5m

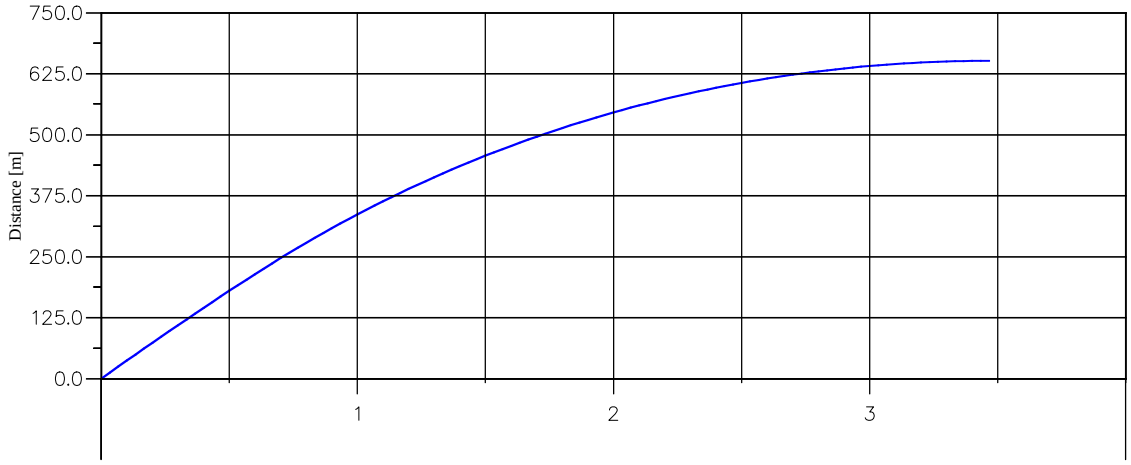
Plotinterval 30 s.

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.5







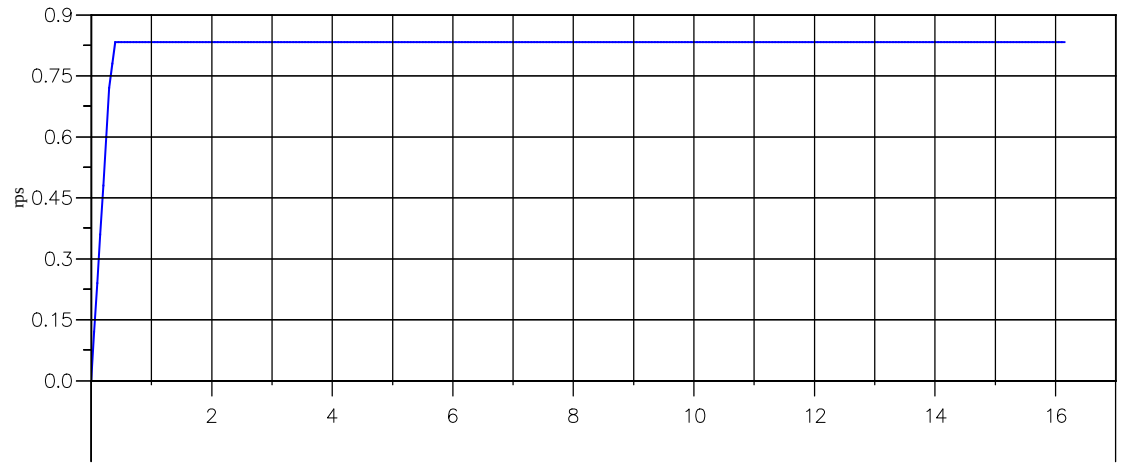
STOPPING MANOEUVRE, h/T = 1.2

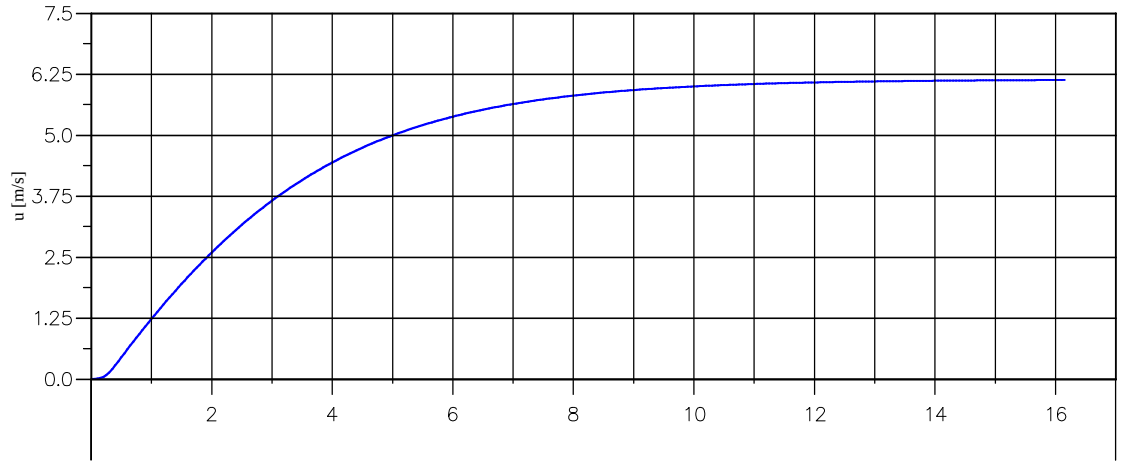
LNGCarrier, Lpp=276.0m, T=9.5m

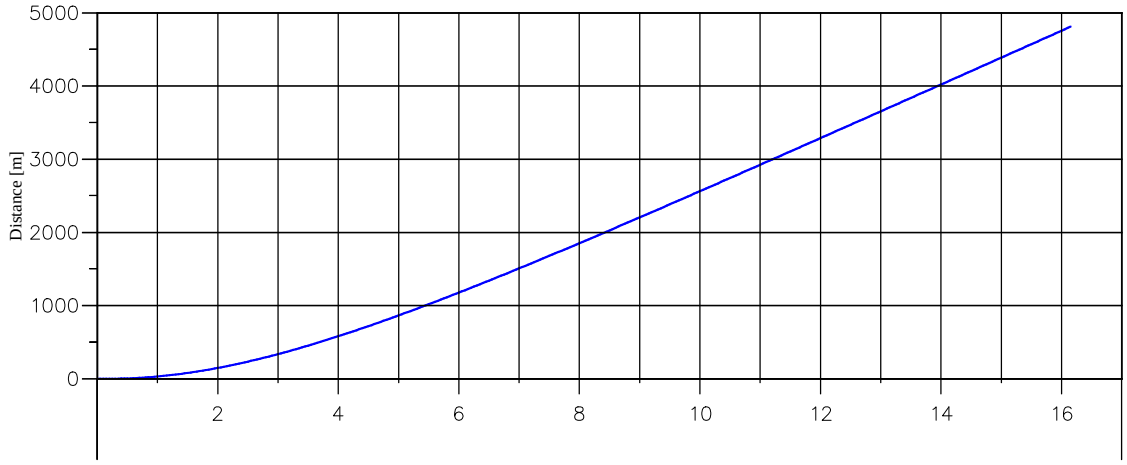
Time in minutes

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.6







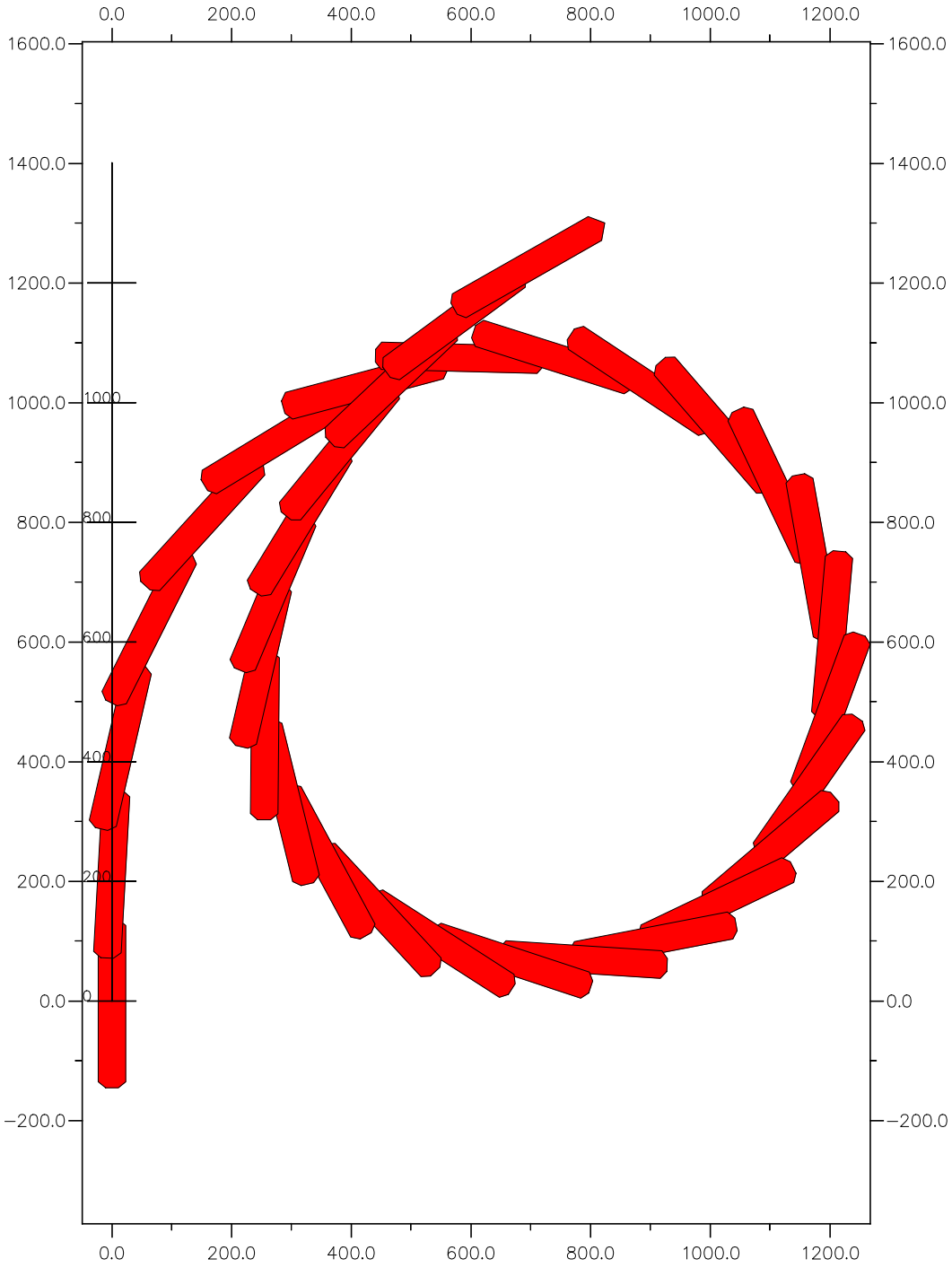
ACCELARATION MANOEUVRE, h/T = 1.2

LNGCarrier, Lpp=276.0m, T=9.5m

Time in minutes

MARIN's NAUTICAL CENTRE MSCN

Fig: 1.7

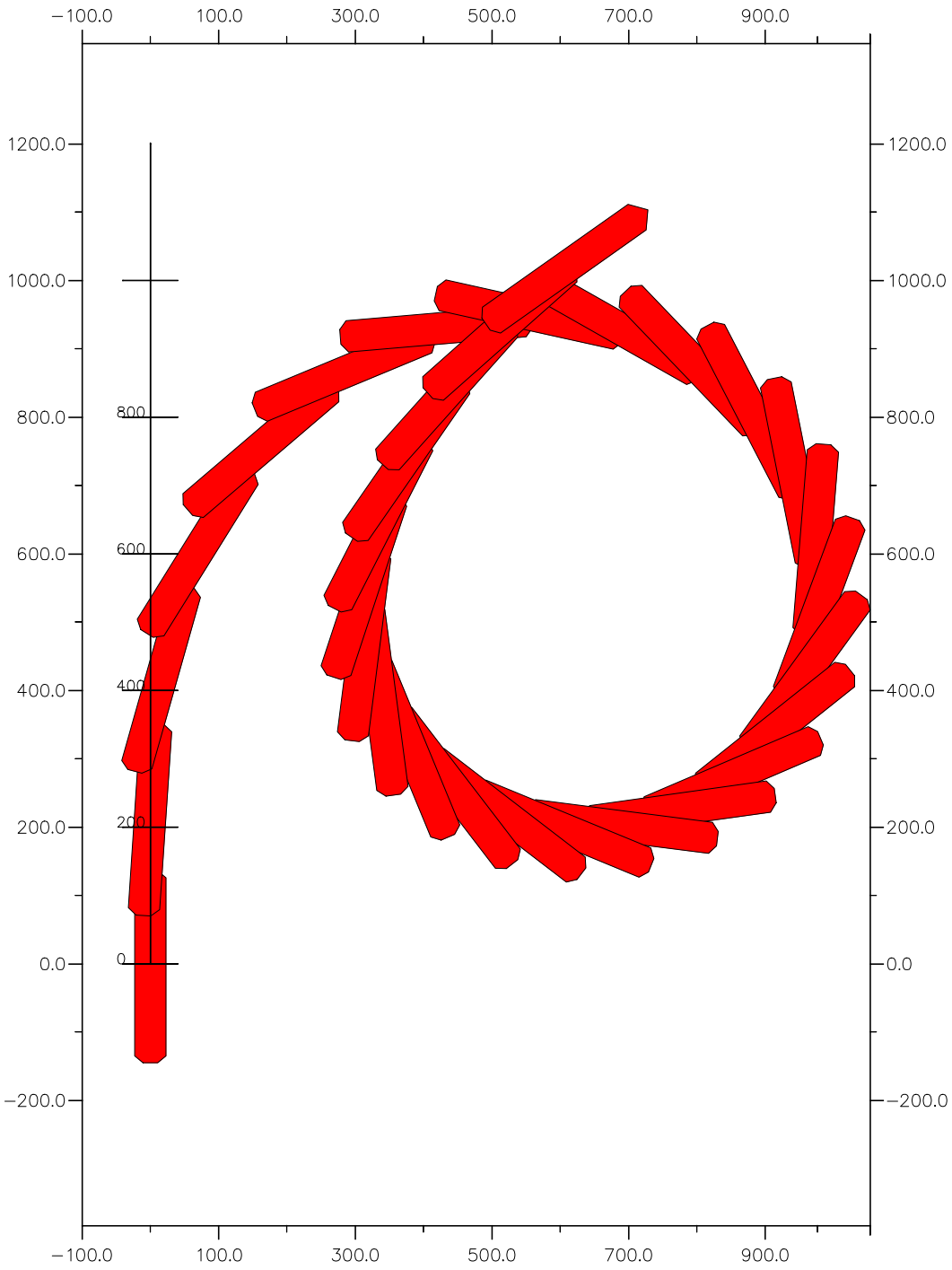


TURNING CIRCLE (20deg), h/T=2.0
LNGCarrier, Lpp=276.0m, T=9.5m

Plotinterval 30 s

MARIN's NAUTICAL CENTRE MSCN

Fig 2.1

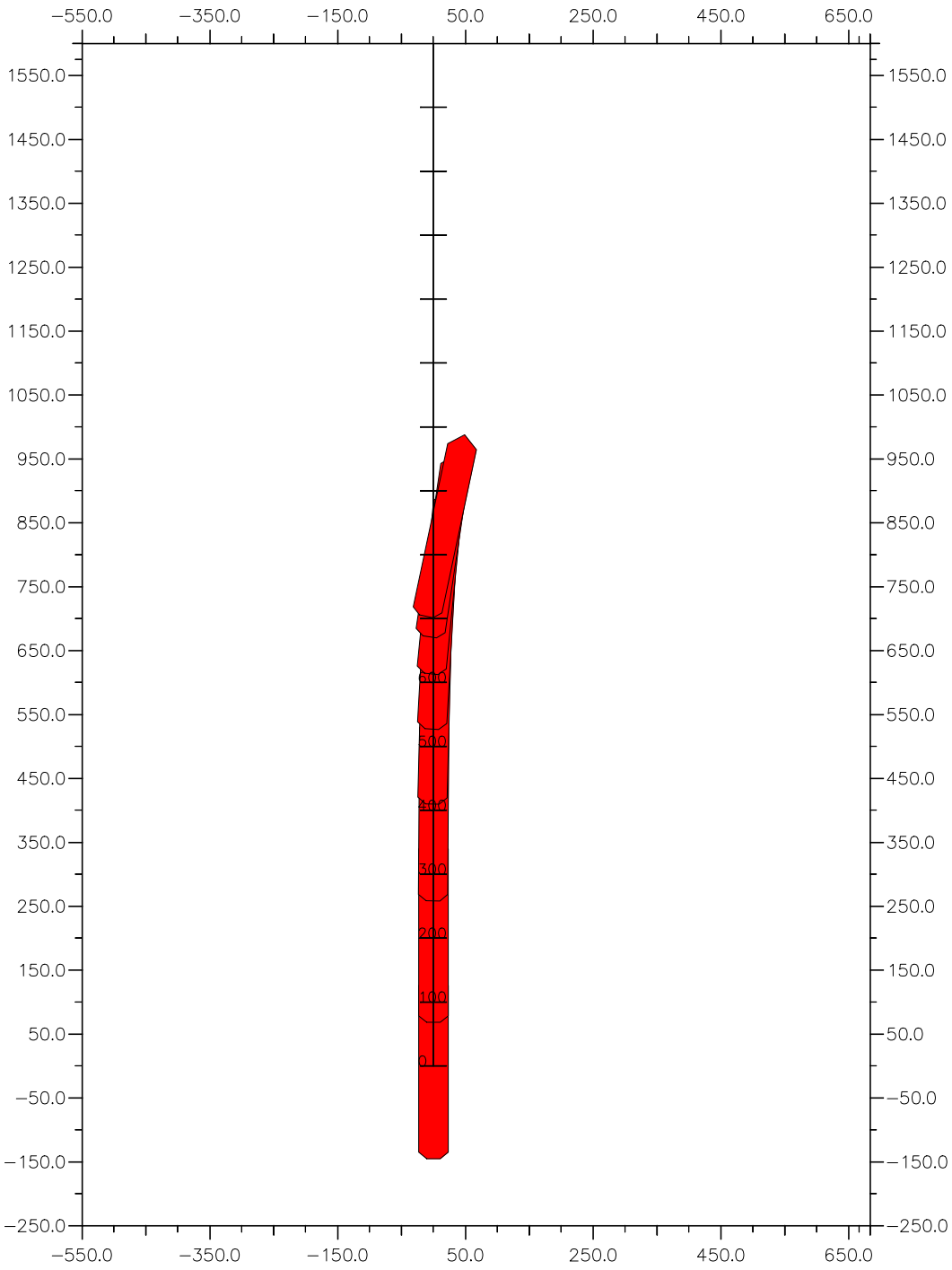


TURNING CIRCLE (35 deg), h/T=2.0
LNGCarrier, Lpp=276.0m, T=9.5m

Plotinterval 30s.

MARIN's NAUTICAL CENTRE MSCN

Fig: 2.2

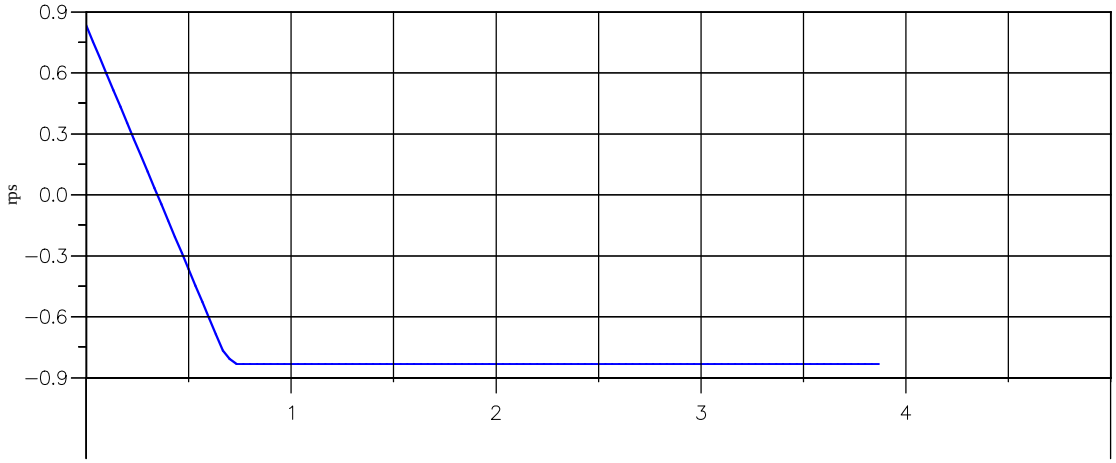


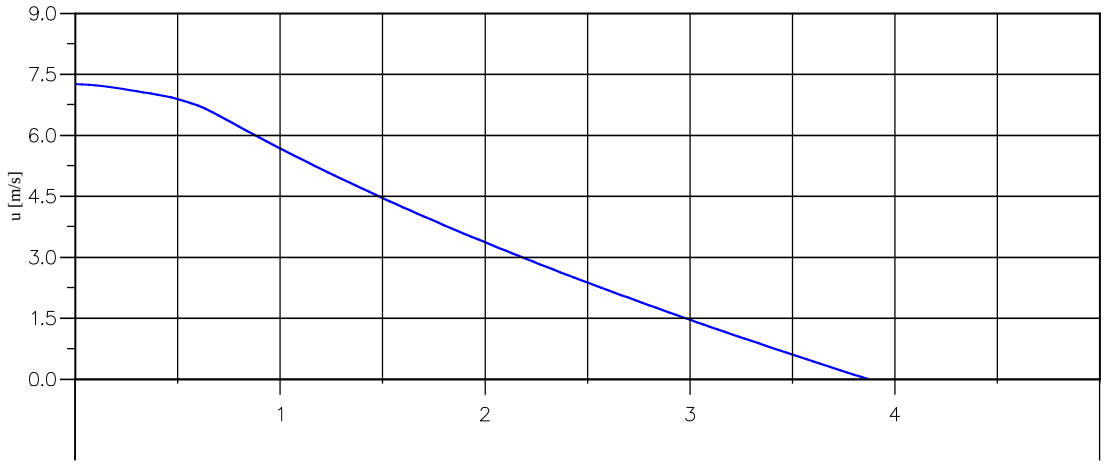
STOPPING MANOEUVRE, h/T = 2.0
LNGCarrierl, Lpp=276.0m, T=9.5m

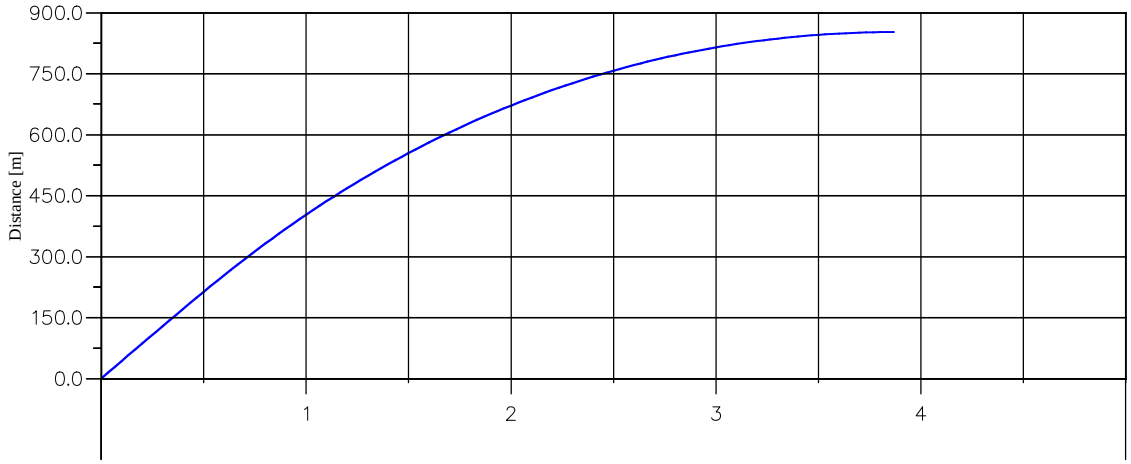
Plotted every 30 s.

MARIN's NAUTICAL CENTRE MSCN

Fig: 2.5







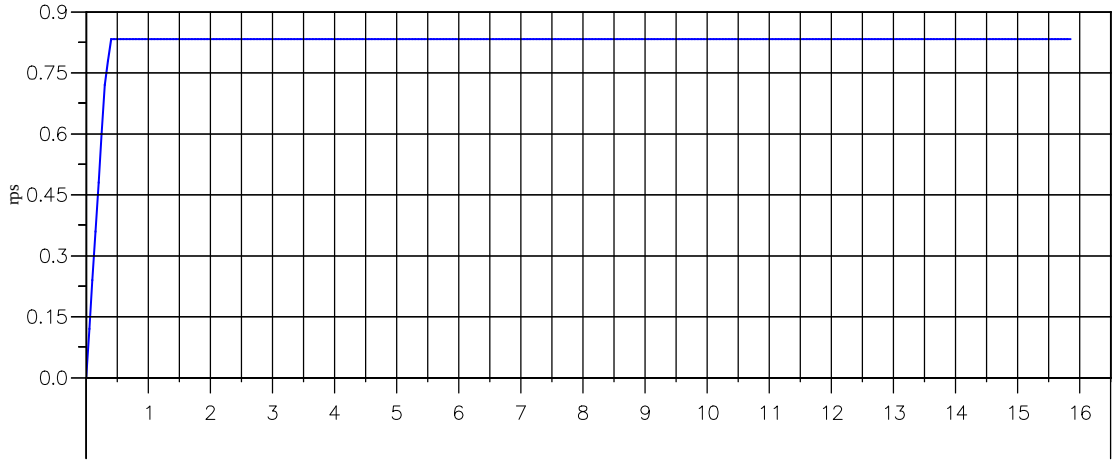
STOPPING MANOEUVRE, h/T = 2.0

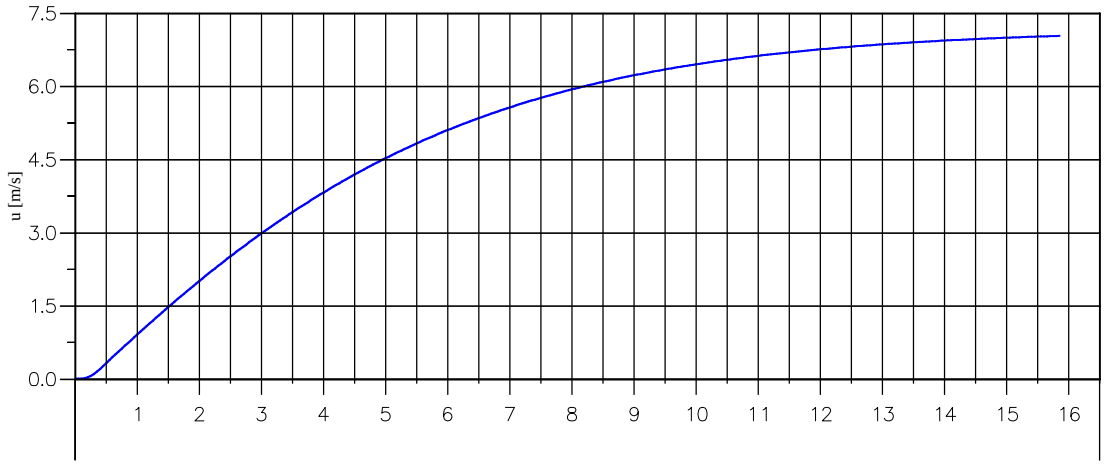
LNGCarrier, Lpp=276.0m, T=9.5m

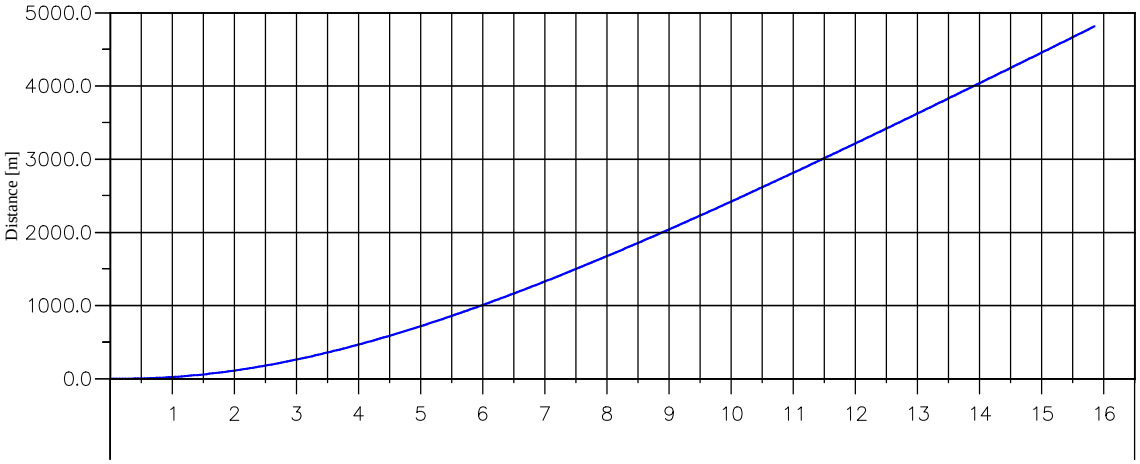
Time in minutes

MARIN's NAUTICAL CENTRE MSCN

Fig: 2.6







ACCELARATION MANOEUVRE, h/T = 2.0

LNGCarrier, Lpp=276.0m, T=9.5m

Time in minutes

MARIN's NAUTICAL CENTRE MSCN

Fig: 2.7