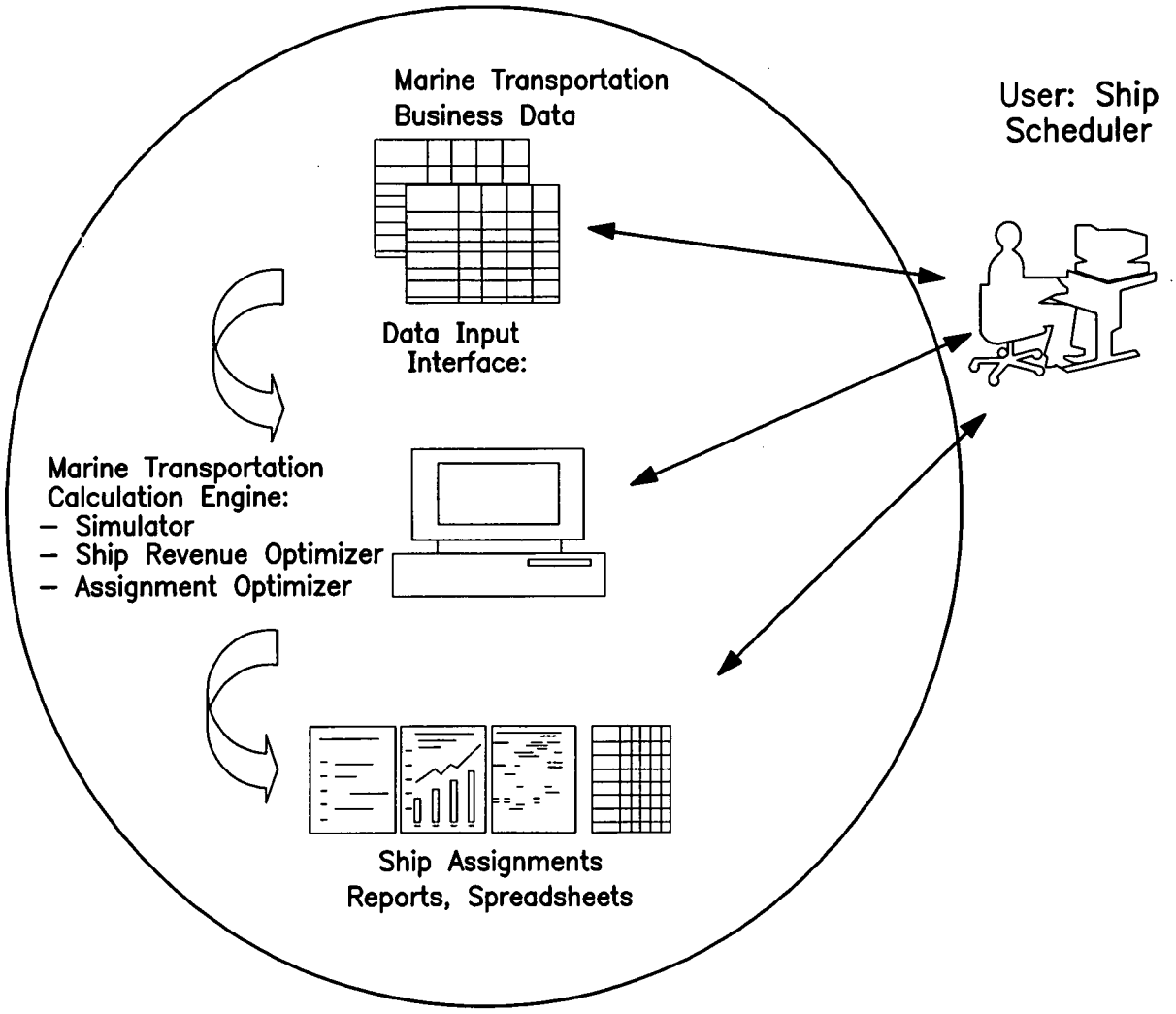

Marine Transportation
Business Data
User: Ship
Scheduler
Data Input
Interface:
Marine Transportation
Calculation Engine:
– Simulator
– Ship Revenue Optimizer
– Assignment Optimizer
Ship Assignments
Reports, Spreadsheets

FIG. 1

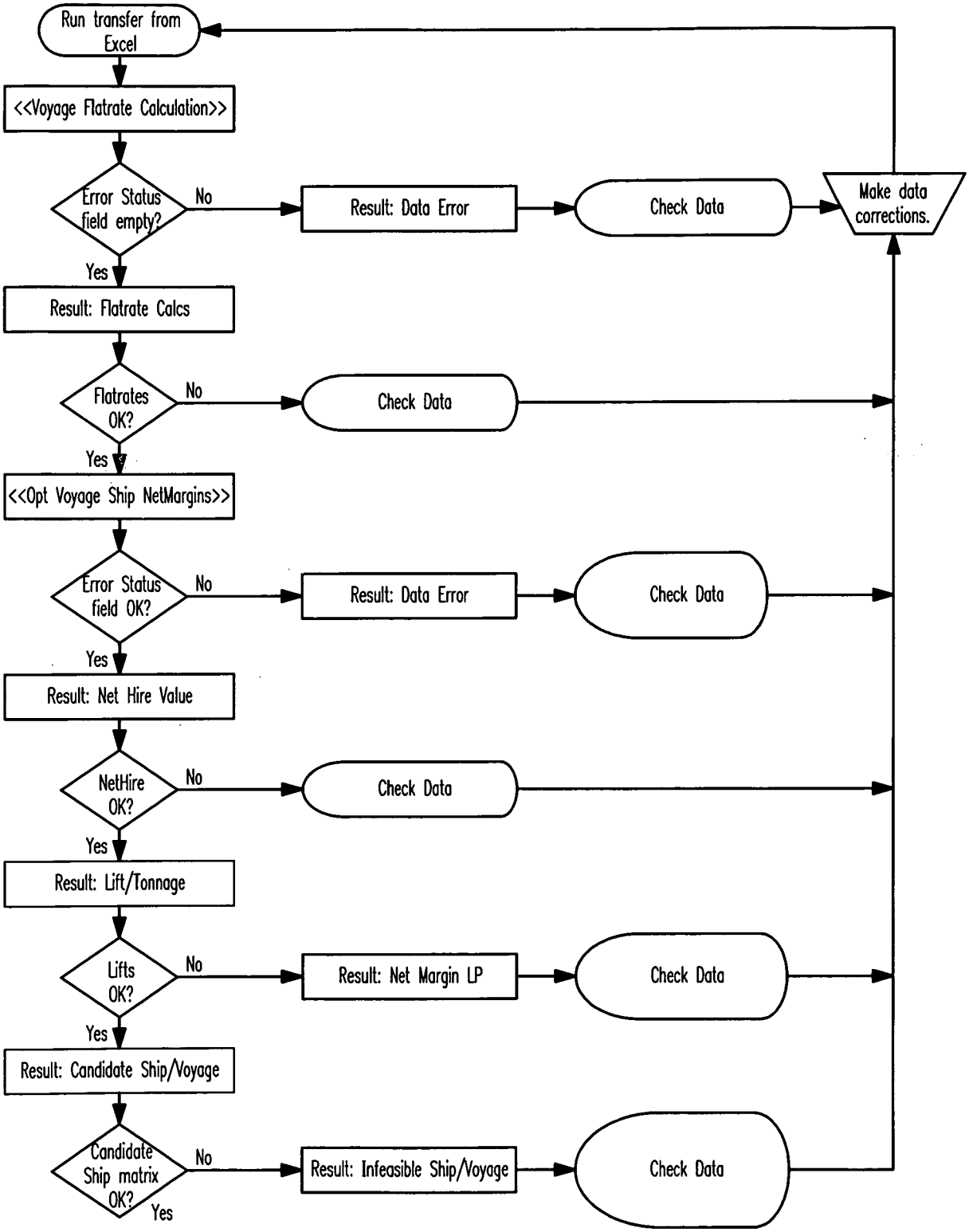

Run transfer from Excel
<<Voyage Flatrate Calculation>>
Error Status field empty?
No
Result: Data Error
Check Data
Make data corrections.
Yes
Result: Flatrate Calcs
Flatrates OK?
No
Check Data
Yes
<<Opt Voyage Ship NetMargins>>
Error Status field OK?
No
Result: Data Error
Check Data
Yes
Result: Net Hire Value
NetHire OK?
No
Check Data
Yes
Result: Lift/Tonnage
Lifts OK?
No
Result: Net Margin LP
Check Data
Yes
Result: Candidate Ship/Voyage
Candidate Ship matrix OK?
No
Result: Infeasible Ship/Voyage
Check Data
Yes

FIG. 2A

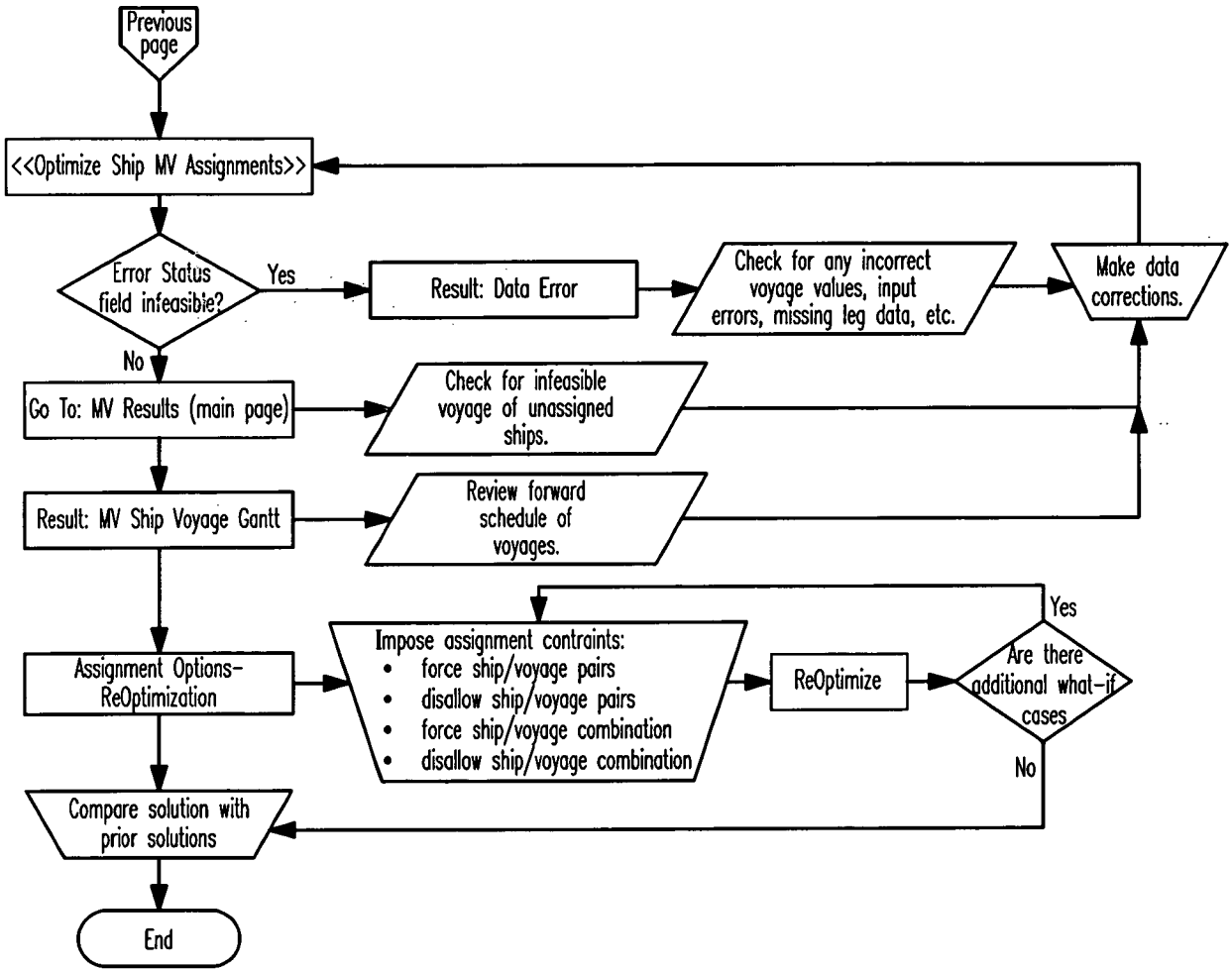
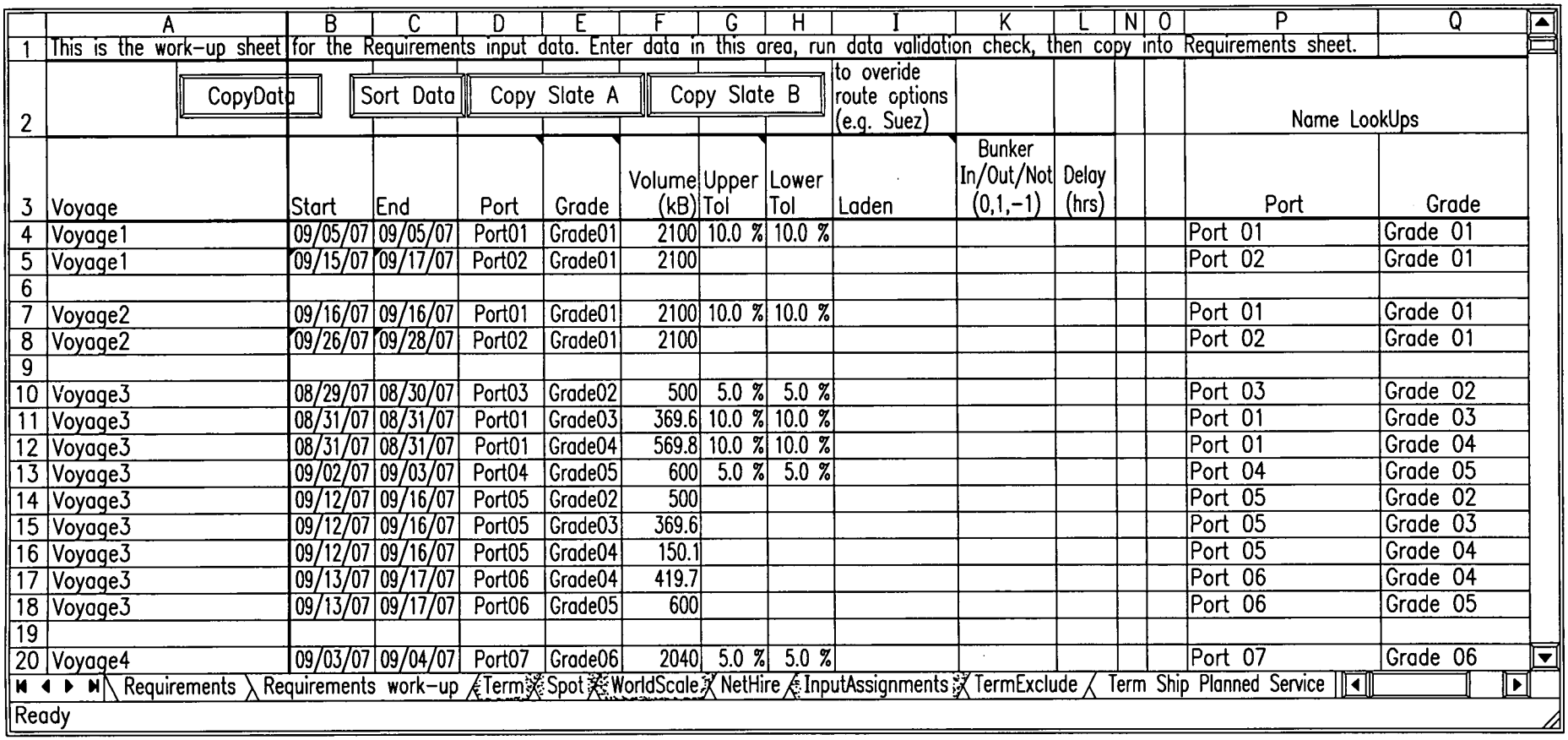

Previous page
<<Optimize Ship MV Assignments>>
Error Status field infeasible?
Yes
Result: Data Error
Check for any incorrect voyage values, input errors, missing leg data, etc.
Make data corrections.
No
Go To: MV Results (main page)
Check for infeasible voyage of unassigned ships.
Result: MV Ship Voyage Gantt
Review forward schedule of voyages.
Assignment Options-ReOptimization
Impose assignment contraints:
• force ship/voyage pairs
• disallow ship/voyage pairs
• force ship/voyage combination
• disallow ship/voyage combination
ReOptimize
Are there additional what-if cases
Yes
No
Compare solution with prior solutions
End

FIG. 2B



	A	B	C	D	E	F	G	H	I	K	L	N	O	P	Q
1	This is the work-up sheet for the Requirements input data. Enter data in this area, run data validation check, then copy into Requirements sheet.														
2		CopyData	Sort Data	Copy Slate A	Copy Slate B				to overide route options (e.g. Suez)					Name LookUps	
3	Voyage	Start	End	Port	Grade	Volume (kB)	Upper Tol	Lower Tol	Laden	Bunker In/Out/Not (0,1,-1)	Delay (hrs)			Port	Grade
4	Voyage1	09/05/07	09/05/07	Port01	Grade01	2100	10.0 %	10.0 %						Port 01	Grade 01
5	Voyage1	09/15/07	09/17/07	Port02	Grade01	2100								Port 02	Grade 01
6															
7	Voyage2	09/16/07	09/16/07	Port01	Grade01	2100	10.0 %	10.0 %						Port 01	Grade 01
8	Voyage2	09/26/07	09/28/07	Port02	Grade01	2100								Port 02	Grade 01
9															
10	Voyage3	08/29/07	08/30/07	Port03	Grade02	500	5.0 %	5.0 %						Port 03	Grade 02
11	Voyage3	08/31/07	08/31/07	Port01	Grade03	369.6	10.0 %	10.0 %						Port 01	Grade 03
12	Voyage3	08/31/07	08/31/07	Port01	Grade04	569.8	10.0 %	10.0 %						Port 01	Grade 04
13	Voyage3	09/02/07	09/03/07	Port04	Grade05	600	5.0 %	5.0 %						Port 04	Grade 05
14	Voyage3	09/12/07	09/16/07	Port05	Grade02	500								Port 05	Grade 02
15	Voyage3	09/12/07	09/16/07	Port05	Grade03	369.6								Port 05	Grade 03
16	Voyage3	09/12/07	09/16/07	Port05	Grade04	150.1								Port 05	Grade 04
17	Voyage3	09/13/07	09/17/07	Port06	Grade04	419.7								Port 06	Grade 04
18	Voyage3	09/13/07	09/17/07	Port06	Grade05	600								Port 06	Grade 05
19															
20	Voyage4	09/03/07	09/04/07	Port07	Grade06	2040	5.0 %	5.0 %						Port 07	Grade 06

Requirements | Requirements work-up | Term | Spot | WorldScale | NetHire | InputAssignments | TermExclude | Term Ship Planned Service

Ready

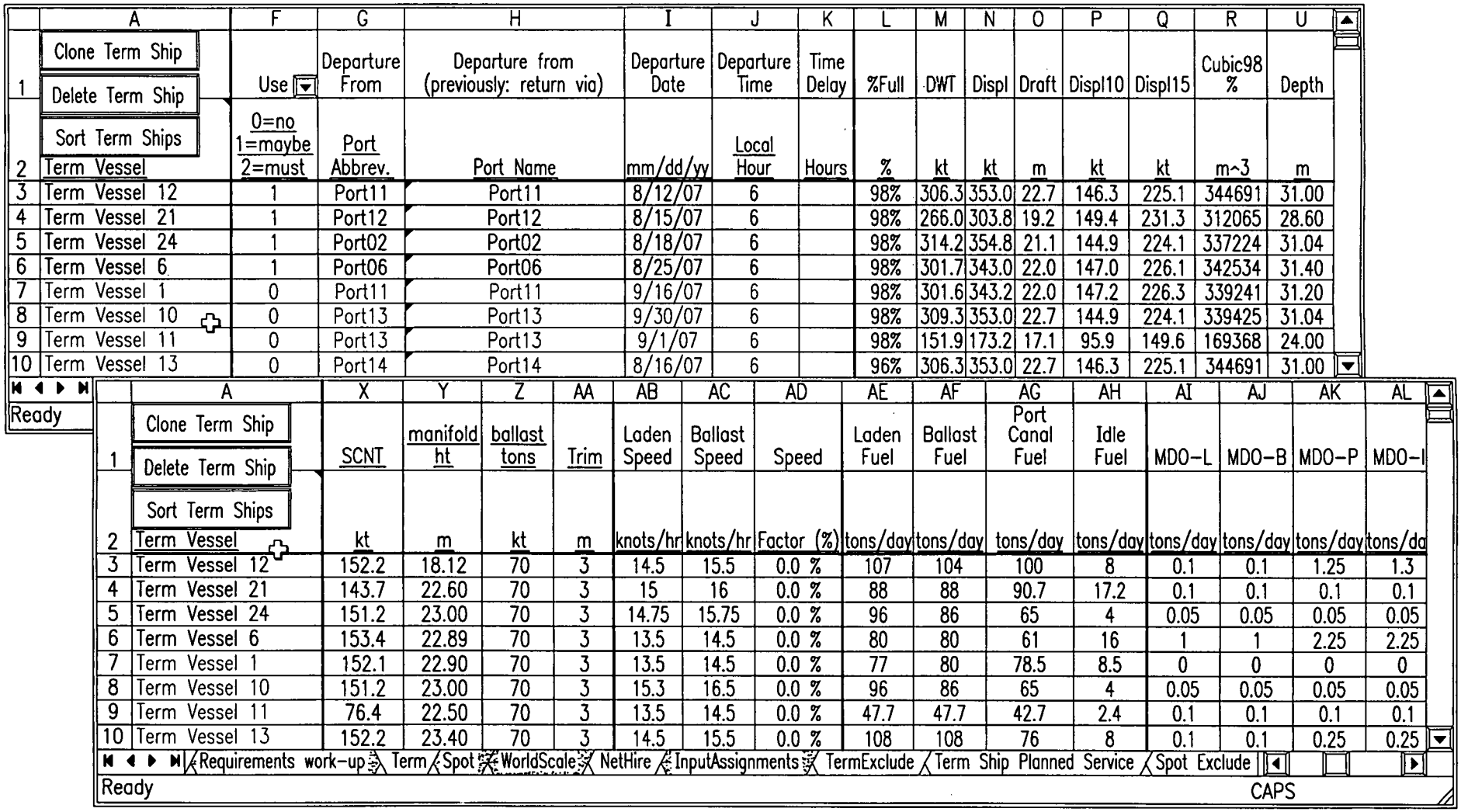
FIG. 3A

	A	B	C	D	E	F	G	H	I	J	K	M	N
1		Min/Max Date				End of Optimization Horizon	10/05/07						
2			12/31/06	12/04/07					Calculated from this page plus term and spot dates.				
3	Voyage	Sequence	StartDate	EndDate	Port	Grade	Action (L/D)	Volume (kB)	Upper Tol	Lower Tol	Laden Route (to override defaults)	Bunker In/Out/Not (0,1,-1)	Delay (hrs)
4	Voyage1	1	09/05/07	09/05/07	Port01	Grade01	L	2100	10.0 %	10.0 %			
5	Voyage1	2	09/15/07	09/17/07	Port02	Grade01	D	2100					
6													
7	Voyage2	1	09/16/07	09/16/07	Port01	Grade01	L	2100	10.0 %	10.0 %			
8	Voyage2	2	09/26/07	09/28/07	Port02	Grade01	D	2100					
9													
10	Voyage3	1	08/29/07	08/30/07	Port03	Grade02	L	500	5.0 %	5.0 %			
11	Voyage3	2	08/31/07	08/31/07	Port01	Grade03	L	369.6	10.0 %	10.0 %			
12	Voyage3	2	08/31/07	08/31/07	Port01	Grade04	L	569.8	10.0 %	10.0 %			
13	Voyage3	3	09/02/07	09/03/07	Port04	Grade05	L	600	5.0 %	5.0 %			
14	Voyage3	4	09/12/07	09/16/07	Port05	Grade02	D	500					
15	Voyage3	4	09/12/07	09/16/07	Port05	Grade03	D	369.6					
16	Voyage3	4	09/12/07	09/16/07	Port05	Grade04	D	150.1					
17	Voyage3	5	09/13/07	09/17/07	Port06	Grade04	D	419.7					
18	Voyage3	5	09/13/07	09/17/07	Port06	Grade05	D	600					
19													
20	Voyage4	1	09/03/07	09/04/07	Port07	Grade06	L	2040	5.0 %	5.0 %			

Requirements | Requirements work-up | Term | Spot | WorldScale | NetHire | InputAssignments | TermExclude | Term Ship Planned Service | Spot Excl

Ready CAPS

FIG. 3B



	A	F	G	H	I	J	K	L	M	N	O	P	Q	R	U
1	Clone Term Ship / Delete Term Ship / Sort Term Ships	Use	Departure From	Departure from (previously: return via)	Departure Date	Departure Time	Time Delay	%Full	DWT	Displ	Draft	Displ10	Displ15	Cubic98 %	Depth
2	Term Vessel	0=no 1=maybe 2=must	Port Abbrev.	Port Name	mm/dd/yy	Local Hour	Hours	%	kt	kt	m	kt	kt	m^3	m
3	Term Vessel 12	1	Port11	Port11	8/12/07	6		98%	306.3	353.0	22.7	146.3	225.1	344691	31.00
4	Term Vessel 21	1	Port12	Port12	8/15/07	6		98%	266.0	303.8	19.2	149.4	231.3	312065	28.60
5	Term Vessel 24	1	Port02	Port02	8/18/07	6		98%	314.2	354.8	21.1	144.9	224.1	337224	31.04
6	Term Vessel 6	1	Port06	Port06	8/25/07	6		98%	301.7	343.0	22.0	147.0	226.1	342534	31.40
7	Term Vessel 1	0	Port11	Port11	9/16/07	6		98%	301.6	343.2	22.0	147.2	226.3	339241	31.20
8	Term Vessel 10	0	Port13	Port13	9/30/07	6		98%	309.3	353.0	22.7	144.9	224.1	339425	31.04
9	Term Vessel 11	0	Port13	Port13	9/1/07	6		98%	151.9	173.2	17.1	95.9	149.6	169368	24.00
10	Term Vessel 13	0	Port14	Port14	8/16/07	6		96%	306.3	353.0	22.7	146.3	225.1	344691	31.00

Ready

	A	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1	Clone Term Ship / Delete Term Ship / Sort Term Ships	SCNT	manifold ht	ballast tons	Trim	Laden Speed	Ballast Speed	Speed	Laden Fuel	Ballast Fuel	Port Canal Fuel	Idle Fuel	MDO-L	MDO-B	MDO-P	MDO-I
2	Term Vessel	kt	m	kt	m	knots/hr	knots/hr	Factor (%)	tons/day	tons/day	tons/day	tons/day	tons/day	tons/day	tons/day	tons/da
3	Term Vessel 12	152.2	18.12	70	3	14.5	15.5	0.0 %	107	104	100	8	0.1	0.1	1.25	1.3
4	Term Vessel 21	143.7	22.60	70	3	15	16	0.0 %	88	88	90.7	17.2	0.1	0.1	0.1	0.1
5	Term Vessel 24	151.2	23.00	70	3	14.75	15.75	0.0 %	96	86	65	4	0.05	0.05	0.05	0.05
6	Term Vessel 6	153.4	22.89	70	3	13.5	14.5	0.0 %	80	80	61	16	1	1	2.25	2.25
7	Term Vessel 1	152.1	22.90	70	3	13.5	14.5	0.0 %	77	80	78.5	8.5	0	0	0	0
8	Term Vessel 10	151.2	23.00	70	3	15.3	16.5	0.0 %	96	86	65	4	0.05	0.05	0.05	0.05
9	Term Vessel 11	76.4	22.50	70	3	13.5	14.5	0.0 %	47.7	47.7	42.7	2.4	0.1	0.1	0.1	0.1
10	Term Vessel 13	152.2	23.40	70	3	14.5	15.5	0.0 %	108	108	76	8	0.1	0.1	0.25	0.25

Requirements work-up | Term | Spot | WorldScale | NetHire | InputAssignments | TermExclude | Term Ship Planned Service | Spot Exclude

Ready CAPS

FIG. 3C

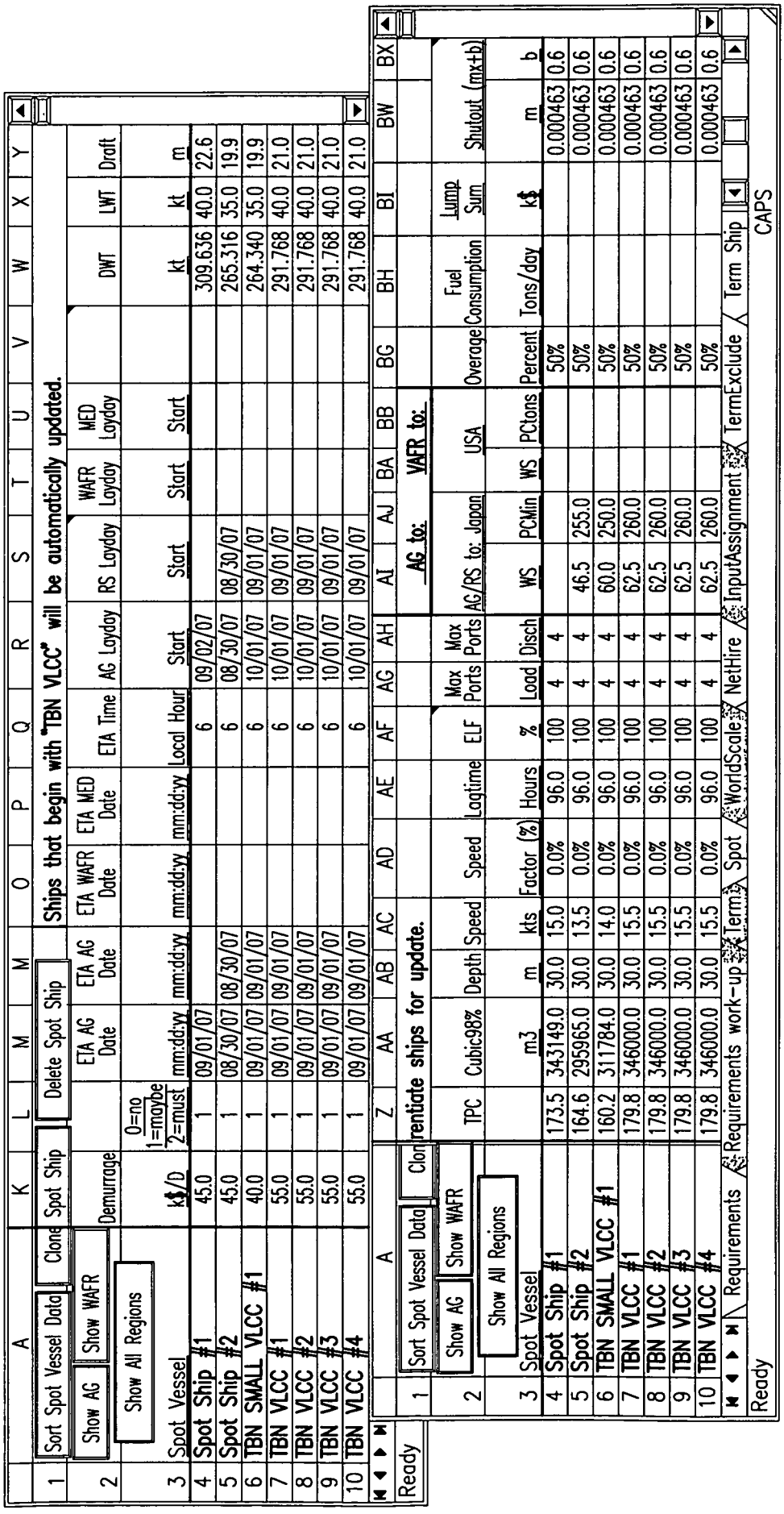
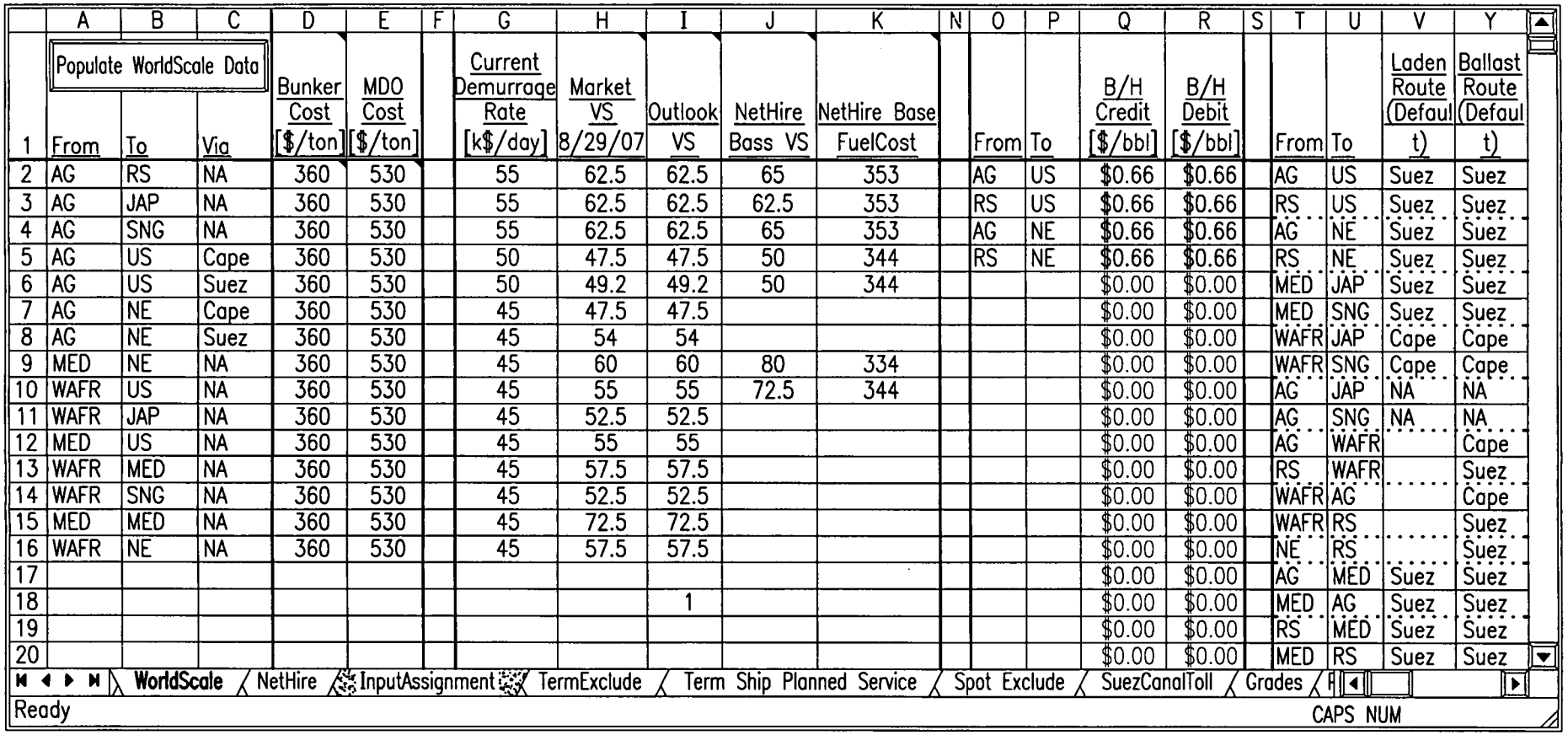

Sort Spot Vessel Data
Clone Spot Ship
Delete Spot Ship
Show AG
Show WAFR
Show All Regions
Ships that begin with "TBN VLCC" will be automatically updated.
Spot Vessel
k$/D
0=no 1=maybe 2=must
Demurrage
ETA AG Date
ETA WAFR Date
ETA MED Date
ETA Time
AG Layday
RS Layday
WAFR Layday
MED Layday
DWT
LWT
Draft
Local Hour
Start
kt
m
Spot Ship #1
Spot Ship #2
TBN SMALL VLCC #1
TBN VLCC #1
TBN VLCC #2
TBN VLCC #3
TBN VLCC #4
Sort Spot Vessel Data
Clone
Show AG
Show WAFR
Show All Regions
differentiate ships for update.
TPC
Cubic98%
Depth
Speed
Factor (%)
Laytime
Hours
ELF
%
Max Ports
Load
Disch
AG to:
VAFR to:
AG/RS to: Japan
USA
WS
PCMin
PCtons
Overage
Percent
Fuel Consumption
Tons/day
Lump Sum
k$
Shutout (mx+b)
m
b
m3
kts
Requirements
work-up
Term
Spot
WorldScale
NetHire
InputAssignment
TermExclude
Term Ship
Ready
CAPS

FIG. 3D



	A	B	C	D	E	F	G	H	I	J	K	N	O	P	Q	R	S	T	U	V	Y
	Populate WorldScale Data			Bunker Cost	MDO Cost		Current Demurrage Rate	Market VS	Outlook	NetHire	NetHire Base				B/H Credit	B/H Debit				Laden Route	Ballast Route
1	From	To	Via	[$/ton]	[$/ton]		[k$/day]	8/29/07	VS	Bass VS	FuelCost		From	To	[$/bbl]	[$/bbl]		From	To	(Default)	(Default)
2	AG	RS	NA	360	530		55	62.5	62.5	65	353		AG	US	$0.66	$0.66		AG	US	Suez	Suez
3	AG	JAP	NA	360	530		55	62.5	62.5	62.5	353		RS	US	$0.66	$0.66		RS	US	Suez	Suez
4	AG	SNG	NA	360	530		55	62.5	62.5	65	353		AG	NE	$0.66	$0.66		AG	NE	Suez	Suez
5	AG	US	Cape	360	530		50	47.5	47.5	50	344		RS	NE	$0.66	$0.66		RS	NE	Suez	Suez
6	AG	US	Suez	360	530		50	49.2	49.2	50	344				$0.00	$0.00		MED	JAP	Suez	Suez
7	AG	NE	Cape	360	530		45	47.5	47.5						$0.00	$0.00		MED	SNG	Suez	Suez
8	AG	NE	Suez	360	530		45	54	54						$0.00	$0.00		WAFR	JAP	Cape	Cape
9	MED	NE	NA	360	530		45	60	60	80	334				$0.00	$0.00		WAFR	SNG	Cape	Cape
10	WAFR	US	NA	360	530		45	55	55	72.5	344				$0.00	$0.00		AG	JAP	NA	NA
11	WAFR	JAP	NA	360	530		45	52.5	52.5						$0.00	$0.00		AG	SNG	NA	NA
12	MED	US	NA	360	530		45	55	55						$0.00	$0.00		AG	WAFR		Cape
13	WAFR	MED	NA	360	530		45	57.5	57.5						$0.00	$0.00		RS	WAFR		Suez
14	WAFR	SNG	NA	360	530		45	52.5	52.5						$0.00	$0.00		WAFR	AG		Cape
15	MED	MED	NA	360	530		45	72.5	72.5						$0.00	$0.00		WAFR	RS		Suez
16	WAFR	NE	NA	360	530		45	57.5	57.5						$0.00	$0.00		NE	RS		Suez
17															$0.00	$0.00		AG	MED	Suez	Suez
18									1						$0.00	$0.00		MED	AG	Suez	Suez
19															$0.00	$0.00		RS	MED	Suez	Suez
20															$0.00	$0.00		MED	RS	Suez	Suez

WorldScale | NetHire | InputAssignment | TermExclude | Term Ship Planned Service | Spot Exclude | SuezCanalToll | Grades

Ready CAPS NUM

8/27

FIG. 3E

	A	B	C	D	E	F	G	H	I	J	K
1	**Input Voyage Ship Assigments (Optional)**										
2											
3	**Voyage**	**Ship**	**User Specification**								
4	Voyage1	Term Vessel 1	0	*(Note: 1 denotes assignment that must be made, -1 denotes assignment that can't be*							
5	Voyage2	Term Vessel 2	0								
6	Voyage3	Term Vessel 3	0								
7	Voyage4	Term Vessel 4	0								
8	Voyage5	Term Vessel 5	0								
9	Voyage6	Term Vessel 6	0								
10	Voyage1	Term Vessel 7	0								
11	Voyage2	Term Vessel 8	0								
12	Voyage3	Term Vessel 9	0								
13	Voyage4	Term Vessel 10	0								
14	Voyage5	Term Vessel 11	0								
15	Voyage6	Term Vessel 12	0								
16	Voyage1	Term Vessel 13	0								
17	Voyage2	Term Vessel 14	0								
18	Voyage3	Term Vessel 15	0								
19	Voyage4	Term Vessel 16	0								
20	Voyage5	Term Vessel 17	0								

NetHire | InputAssignment | TermExclude | Term Ship Planned Service | Spot Exclude | SuezCanalToll | Grades | Ports | LegDa

Ready CAPS NUM

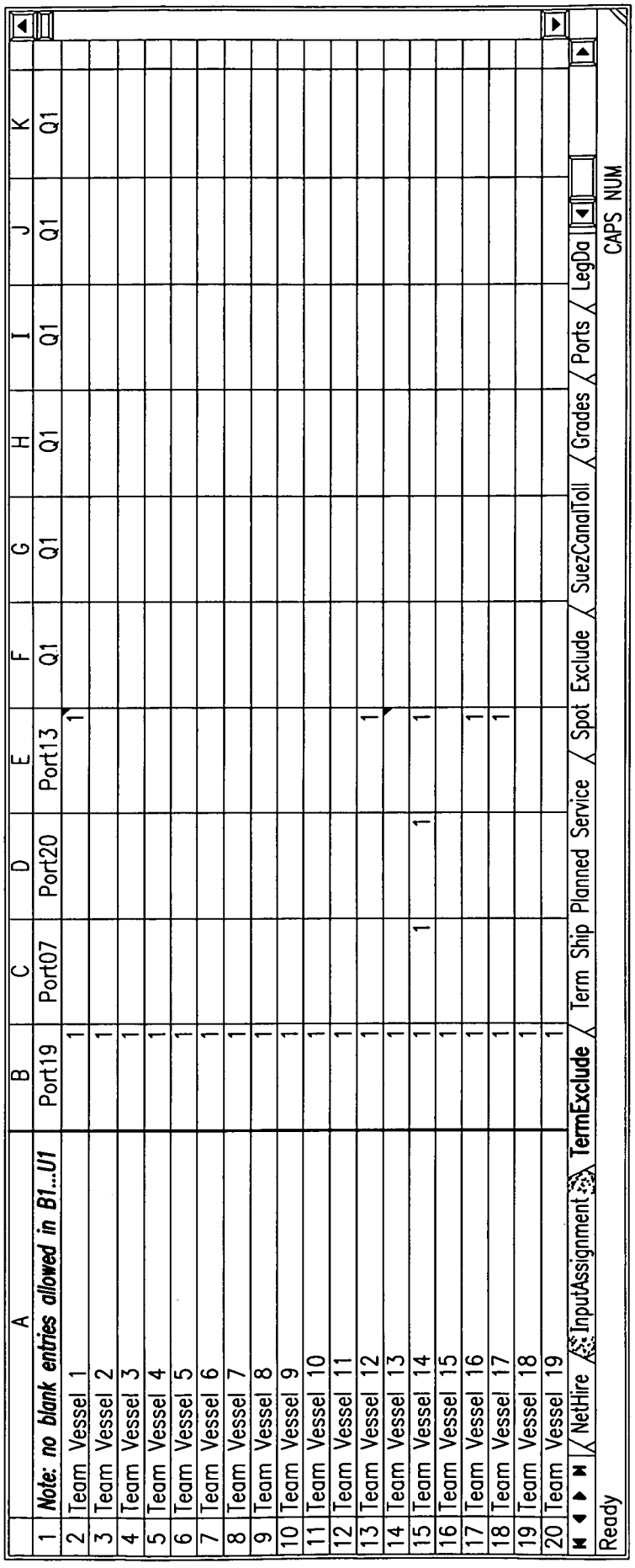
FIG. 3F

	A	B	C	D	F	G	H	J	M	Q	U	X	AB	AF	AI	AM
1	Region Codes:	AG	AS	BS	Sort Net Hire				Net Hire k$/D			Net Hire Change, k$/D per 10 WS			Net Hire Change, k$/D per 10 $/t Fuel	
2	JAP	MED	NE	RS				From:	AG	WAFR		AG	WAFR		AG	WAFR
3	SK	SNG	US	WAFR				To:	JAP	US		JAP	US		JAP	US
4		South:	Notional	Voyage	North:	Notional	Voyage	Via:	NA	NA		NA	NA		NA	NA
5	Term Ship:	From:	To:	Via:	From:	To:	Via:									
6	Term Vessel 1	AG	JAP	NA	WAFR	US	NA		41.3	46.8		10.83	9.66		0.67	0.67
7	Term Vessel 2	AG	JAP	NA	WAFR	US	NA		35.3	41.3		10.11	9.11		0.72	0.72
8	Term Vessel 3	AG	JAP	NA	WAFR	US	NA		39.1	46.0		11.18	10.17		0.83	0.84
9	Term Vessel 4	AG	JAP	NA	WAFR	US	NA		38.2	45.1		11.18	10.17		0.85	0.87
10	Term Vessel 5	AG	JAP	NA	WAFR	US	NA		34.0	40.7		10.16	9.24		0.75	0.75
11	Term Vessel 6	AG	JAP	NA	WAFR	US	NA		36.4	42.1		10.50	9.38		0.72	0.72
12	Term Vessel 7	AG	JAP	NA	WAFR	US	NA		36.9	42.9		11.27	10.07		0.88	0.88
13	Term Vessel 8	AG	JAP	NA	WAFR	US	NA		34.9	41.3		10.66	9.61		0.84	0.84
14	Term Vessel 9	AG	JAP	NA	WAFR	US	NA		33.8	40.4		10.03	9.24		0.73	0.76
15	Term Vessel 10	AG	JAP	NA	WAFR	US	NA		35.0	41.8		10.60	9.67		0.81	0.83
16	Term Vessel 11	WAFR	US	NA	WAFR	US	NA			48.5			4.92			0.43
17	Term Vessel 12	AG	JAP	NA	WAFR	US	NA		34.5	41.7		9.79	9.38		0.67	0.78
18	Term Vessel 13	AG	JAP	NA	WAFR	US	NA		35.6	42.9		10.22	9.68		0.75	0.81
19	Term Vessel 14	AG	JAP	NA	WAFR	US	NA		20.7	28.6		7.75	7.39		0.71	0.71
20	Term Vessel 15	AG	JAP	NA	WAFR	US	NA		33.3	39.5		9.97	9.66		0.74	0.88

Requirements | Requirements work-up | Term | Spot | WorldScale | NetHire | InputAssignments | TermExclude | Term Ship Planned

Ready CAPS

FIG. 3G



	A	B	C	D	E	F	G	H	I	J	K
1	***Note: no blank entries allowed in B1...U1***	Port19	Port07	Port20	Port13	Q1	Q1	Q1	Q1	Q1	Q1
2	Team Vessel 1	1			1						
3	Team Vessel 2	1									
4	Team Vessel 3	1									
5	Team Vessel 4	1									
6	Team Vessel 5	1									
7	Team Vessel 6	1									
8	Team Vessel 7	1									
9	Team Vessel 8	1									
10	Team Vessel 9	1									
11	Team Vessel 10	1									
12	Team Vessel 11	1									
13	Team Vessel 12	1			1						
14	Team Vessel 13	1									
15	Team Vessel 14	1	1	1	1						
16	Team Vessel 15	1									
17	Team Vessel 16	1			1						
18	Team Vessel 17	1			1						
19	Team Vessel 18	1									
20	Team Vessel 19	1									

NetHire | InputAssignment | TermExclude | Term Ship | Planned Service | Spot Exclude | SuezCanalToll | Grades | Ports | LegDa

Ready

CAPS NUM

FIG. 3H

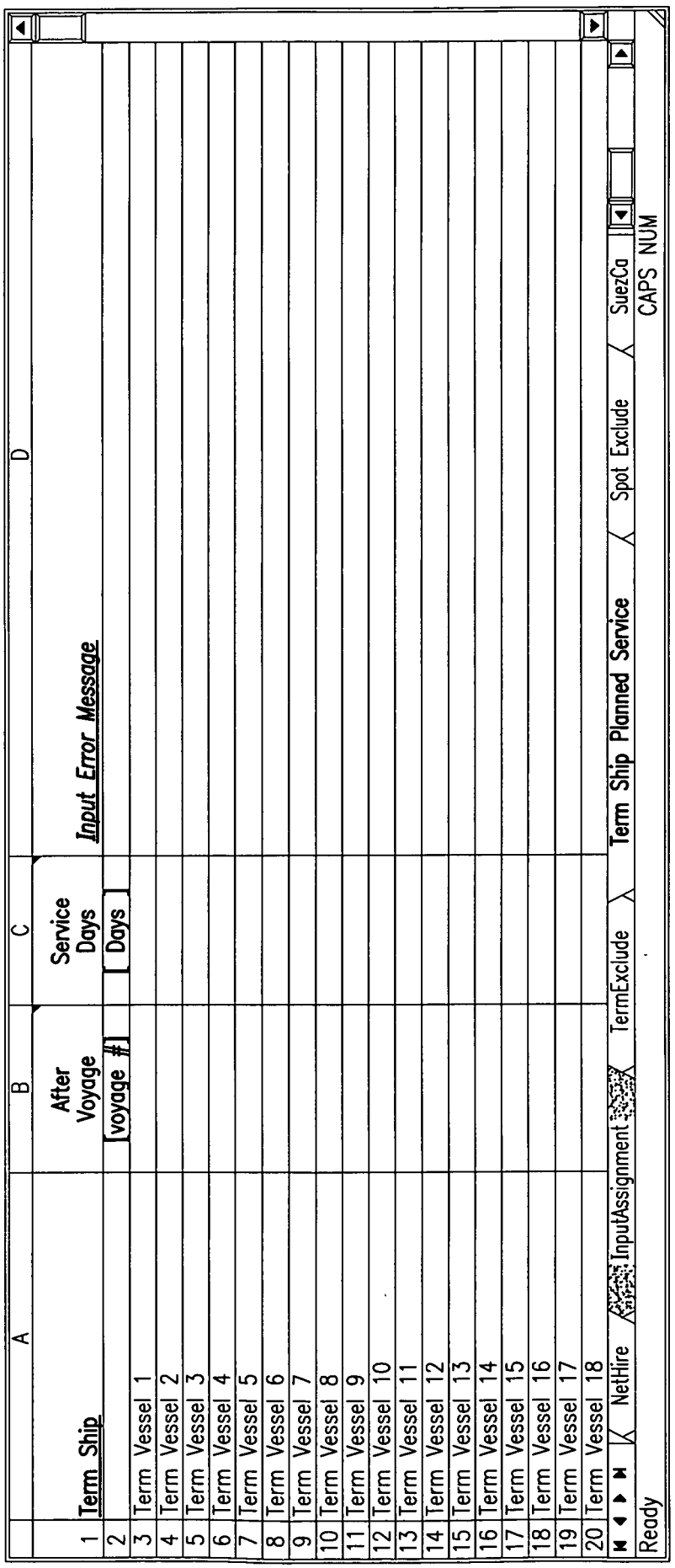

A
B
C
D
Term Ship
After Voyage
Service Days
Input Error Message
voyage #
Days
Term Vessel 1
Term Vessel 2
Term Vessel 3
Term Vessel 4
Term Vessel 5
Term Vessel 6
Term Vessel 7
Term Vessel 8
Term Vessel 9
Term Vessel 10
Term Vessel 11
Term Vessel 12
Term Vessel 13
Term Vessel 14
Term Vessel 15
Term Vessel 16
Term Vessel 17
Term Vessel 18
NetHire
InputAssignment
TermExclude
Term Ship Planned Service
Spot Exclude
SuezCa
Ready
CAPS NUM

FIG. 3I

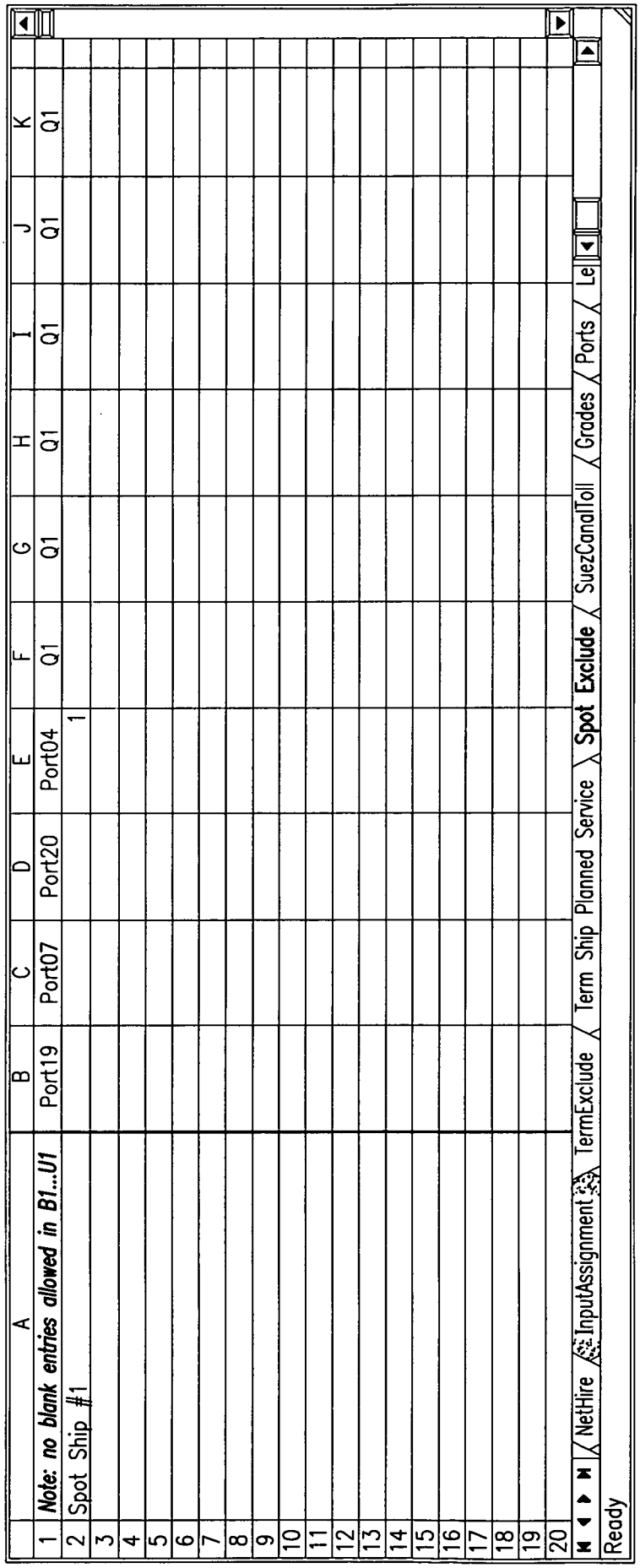
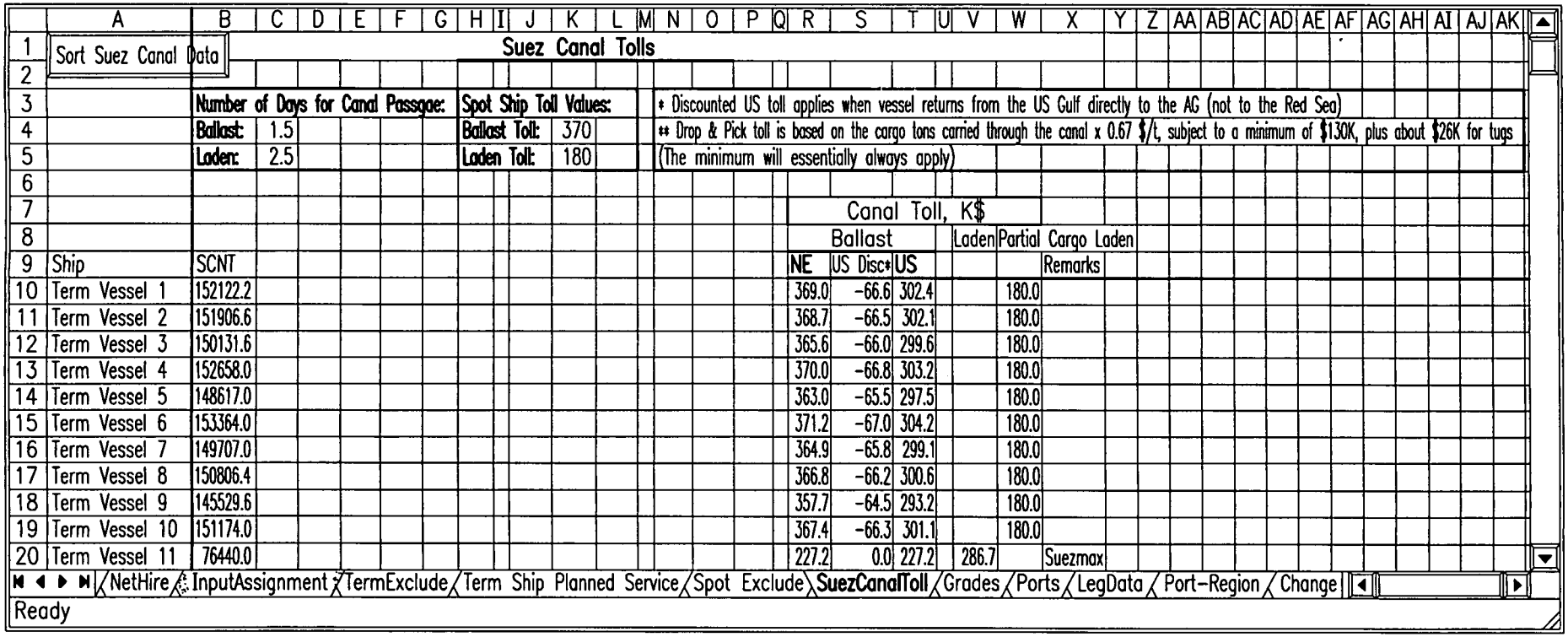

A
B
C
D
E
F
G
H
I
J
K
1 Note: no blank entries allowed in B1...U1
Port19
Port07
Port20
Port04
Q1
Q1
Q1
Q1
Q1
2 Spot Ship #1
1
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
NetHire
InputAssignment
TermExclude
Term Ship
Planned Service
Spot Exclude
SuezCanalToll
Grades
Ports
Le
Ready

FIG. 3J



Sort Suez Canal Data

Suez Canal Tolls

Number of Days for Canal Passage:	
Ballast:	1.5
Laden:	2.5
Spot Ship Toll Values:	
Ballast Toll:	370
Laden Toll:	180

* Discounted US toll applies when vessel returns from the US Gulf directly to the AG (not to the Red Sea)

** Drop & Pick toll is based on the cargo tons carried through the canal x 0.67 $/t, subject to a minimum of $130K, plus about $26K for tugs

(The minimum will essentially always apply)

			Canal Toll, K$					
			Ballast			Laden	Partial Cargo Laden	
Ship	SCNT		NE	US Disc*	US			Remarks
Term Vessel 1	152122.2		369.0	-66.6	302.4		180.0	
Term Vessel 2	151906.6		368.7	-66.5	302.1		180.0	
Term Vessel 3	150131.6		365.6	-66.0	299.6		180.0	
Term Vessel 4	152658.0		370.0	-66.8	303.2		180.0	
Term Vessel 5	148617.0		363.0	-65.5	297.5		180.0	
Term Vessel 6	153364.0		371.2	-67.0	304.2		180.0	
Term Vessel 7	149707.0		364.9	-65.8	299.1		180.0	
Term Vessel 8	150806.4		366.8	-66.2	300.6		180.0	
Term Vessel 9	145529.6		357.7	-64.5	293.2		180.0	
Term Vessel 10	151174.0		367.4	-66.3	301.1		180.0	
Term Vessel 11	76440.0		227.2	0.0	227.2	286.7		Suezmax

NetHire | InputAssignment | TermExclude | Term Ship Planned Service | Spot Exclude | SuezCanalToll | Grades | Ports | LegData | Port-Region | Change

Ready

FIG. 3K

	A	B	C	D	E	F	G	H	I	J	L	M	N	O
1		L	BERTH Start Time	Misc (Berth, etc) Tim	Pumping Rate	BERTH Cut-Off Tim	DE-BERTH Cut-Off Time	Grade Switch	Term Port Charg	Term Port Charge	Temperature	Arrival DWT	Min DWT	Max Arrival Cargo
2	**Port**		**Hour**	**Hour**	**kB/Hr**	**Hours**	**Hours**	**Hours**	**KS. VLCC**	**KS. Suez**	**F**	**kt**	**kt**	**kt**
3	**Default**	D	6	6	50	24	24	1	0	0	105	999	0	999
4	Port01	L	12	6	50	24	24	1	30	19.5	105	999	0	999
5	Port02	D	6	6	50	24	24	1	0	0	60	999	0	999
6	Port03	L	6	6	50	24	24	1	66	58	105	999	0	999
7	Port04	L	6	6	50	24	24	1	40	38	105	999	0	999
8	Port05	D	6	6	50	24	24	1	0	0	60	999	0	999
9	Port06	D	6	6	50	24	24	1	45	25.5	60	320	0	999
10	Port07	L	6	6	50	24	24	1	0	0	105	999	0	999

	A	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1		Max Arrival Cargo	Min Cargo	Max Cargo	Max Depart Draft	Max Arrival Draft	Min Draft	Max Depart Displ	Max Arrival Displ	Min Displ	Max bow FRBD	Max Arrival FRBD	Max mflh t	UTC Offset	Voyage Value WS Multiplier	Voyage Value WS Constant
2	**Port**	**kB**	**kB**	**kt**	**m**	**m**	**m**	**kt**	**kt**	**kt**	**m**	**m**	**m**	**Hour**	**na**	**na**
3	**Default**	9999	0	999	99	99	0	999	999	0	99	99	99	0	1.000	0.00
4	Port01	9999	0	999	21	17.98	0	999	999	0	99	99	99	−3	1.000	0.00
5	Port02	9999	0	999	99	99	0	999	999	0	99	99	99	−3	1.000	0.00
6	Port03	9999	0	999	12.5	99	0	999	152	0	99	99	99	−3	1.000	0.00
7	Port04	9999	0	999	99	99	0	999	999	0	99	99	99	−3	1.000	0.00
8	Port05	9999	0	999	99	22	0	999	999	0	99	99	99	−8	1.000	0.00
9	Port06	9999	0	999	99	21.5	0	387	387	0	99	99	99	−8	1.000	0.00
10	Port07	9999	0	450	27.43	15.22	0	500	999	0	99	99	99	−3	1.000	0.00

Select dest

NetHire | InputAssignment | TermExclude | Term Ship Planned Service | Spot Exclude | SuezCanalToll | Grades | Ports

Select destination and press ENTER or choose Paste

CAPS

FIG. 3L

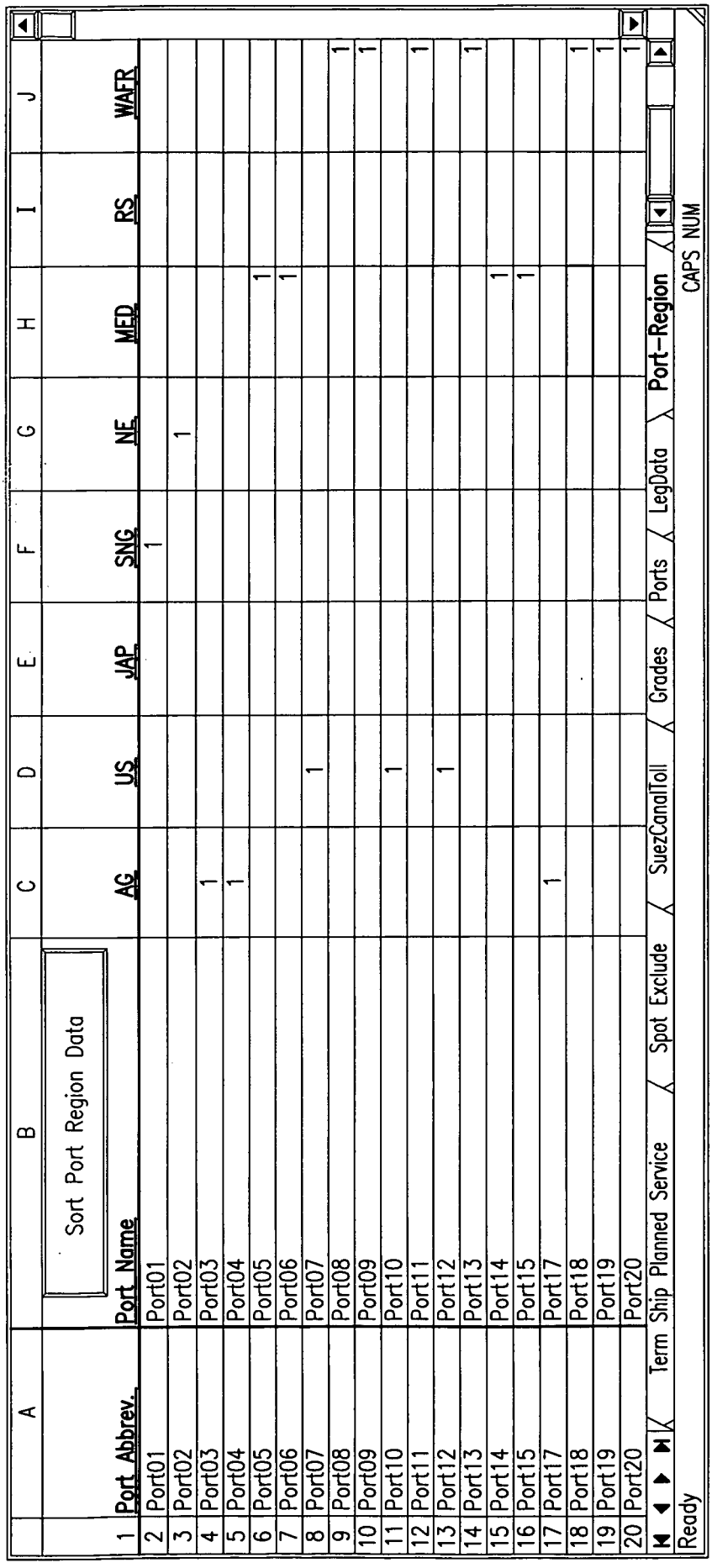

Sort Port Region Data
Port_Abbrev
Port_Name
AG
US
JAP
SNG
NE
MED
RS
WAFR
Port01
Port02
Port03
Port04
Port05
Port06
Port07
Port08
Port09
Port10
Port11
Port12
Port13
Port14
Port15
Port17
Port18
Port19
Port20
Term
Ship Planned Service
Spot Exclude
SuezCanalToll
Grades
Ports
LegData
Port-Region
Ready
CAPS NUM

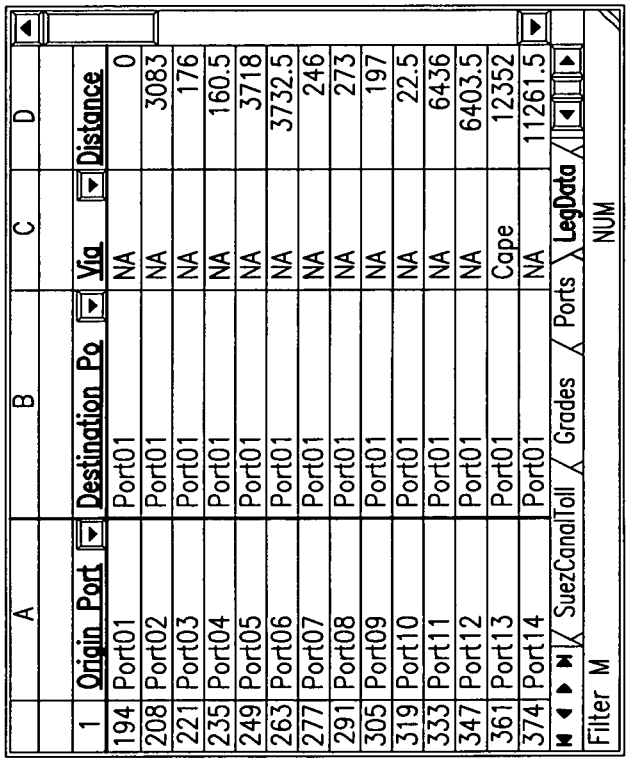
FIG. 3M

	A	B	C	D	E	F	G	H	I	J	K	L
1			(Input)	Density (60F)	Tolerances			Crude Density Temperature				
2	Crude (Abbr)	Crude	API	B/t	Upper	Lower		Adjustment Factor				
3	Grade01	Grade01	33	7.329	10.0%	10.0%		0.980				
4	Grade02	Grade02	56	8.355	5.0%	5.0%		Sort Grade Data				
5	Grade03	Grade03	28	7.106	10.0%	10.0%						
6	Grade04	Grade04	39	7.596	10.0%	10.0%						
7	Grade05	Grade05	27	7.061	5.0%	5.0%						
8	Grade06	Grade06	31	7.239	5.0%	5.0%		Input API gravity, and B/t (bbls/ton) is calculate (do NOT edit column D formulas) as follows:				
9	Grade07	Grade07	41	7.686	5.0%	5.0%						
10	Grade08	Grade08	55	8.310	5.0%	5.0%						
11	Grade09	Grade09	29	7.150	5.0%	5.0%						
12	Grade10	Grade10	33.5	7.351	5.0%	10.0%		Specific Gravity (SPGR)				
13	Grade11	Grade11	28.5	7.128	5.0%	5.0%		141.5 / (131.5 + API)				
14	Grade12	Grade12	50	8.087	5.0%	5.0%		BBL/ton				
15	Grade13	Grade13	28	7.106	5.0%	5.0%		1/ (SPGR * 0.15885437 – 0.000194)				
16	Grade14	Grade14	58.2	8.453	5.0%	5.0%						
17	Grade15	Grade15	30.5	7.217	10.0%	10.0%						
18	Grade16	Grade16	31.5	7.262	5.0%	5.0%						
19	Grade17	Grade17	19.5	6.726	5.0%	5.0%						
20	Grade18	Grade18	20.5	6.771	5.0%	5.0%						

WorldScale / NetHire / InputAssignment / TermExclude / Term Ship Planned Service / Spot Exclude / SuezCanalToll / Grades / Ports / LegData / Port-Re

Ready NUM

FIG. 3N



	A	B	C	D
1	Origin Port	Destination Po	Via	Distance
194	Port01	Port01	NA	0
208	Port02	Port01	NA	3083
221	Port03	Port01	NA	176
235	Port04	Port01	NA	160.5
249	Port05	Port01	NA	3718
263	Port06	Port01	NA	3732.5
277	Port07	Port01	NA	246
291	Port08	Port01	NA	273
305	Port09	Port01	NA	197
319	Port10	Port01	NA	22.5
333	Port11	Port01	NA	6436
347	Port12	Port01	NA	6403.5
361	Port13	Port01	Cape	12352
374	Port14	Port01	NA	11261.5

SuezCanalToll / Grades / Ports / LegData

Filter M NUM

FIG. 30

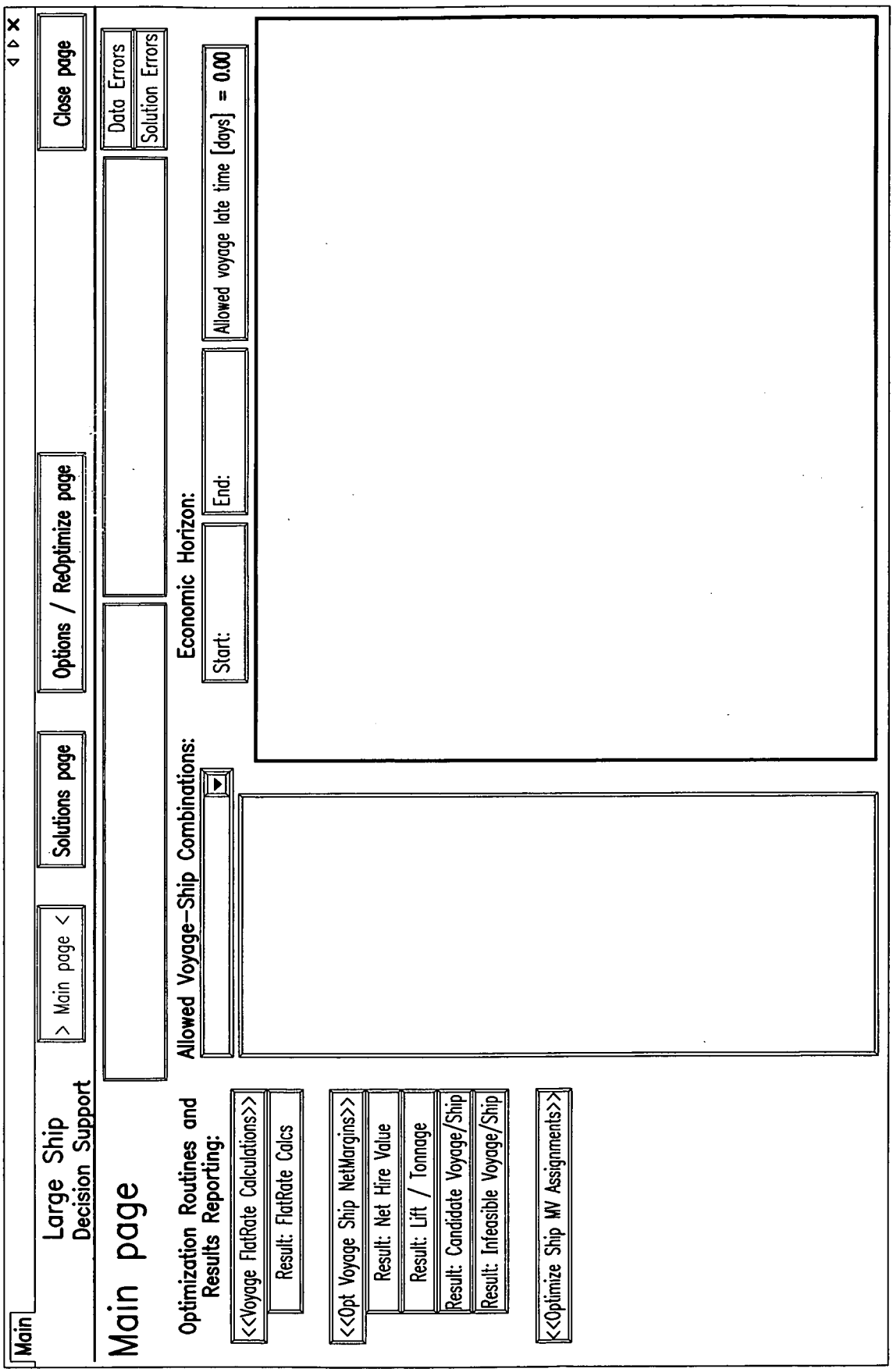

Main
Large Ship
Decision Support
> Main page <
Solutions page
Options / ReOptimize page
Close page
Main page
Data Errors
Solution Errors
Optimization Routines and
Results Reporting:
Allowed Voyage–Ship Combinations:
Economic Horizon:
Start:
End:
Allowed voyage late time [days] = 0.00
<<Voyage FlatRate Calculations>>
Result: FlatRate Calcs
<<Opt Voyage Ship NetMargins>>
Result: Net Hire Value
Result: Lift / Tonnage
Result: Candidate Voyage/Ship
Result: Infeasible Voyage/Ship
<<Optimize Ship MV Assignments>>

FIG. 3P

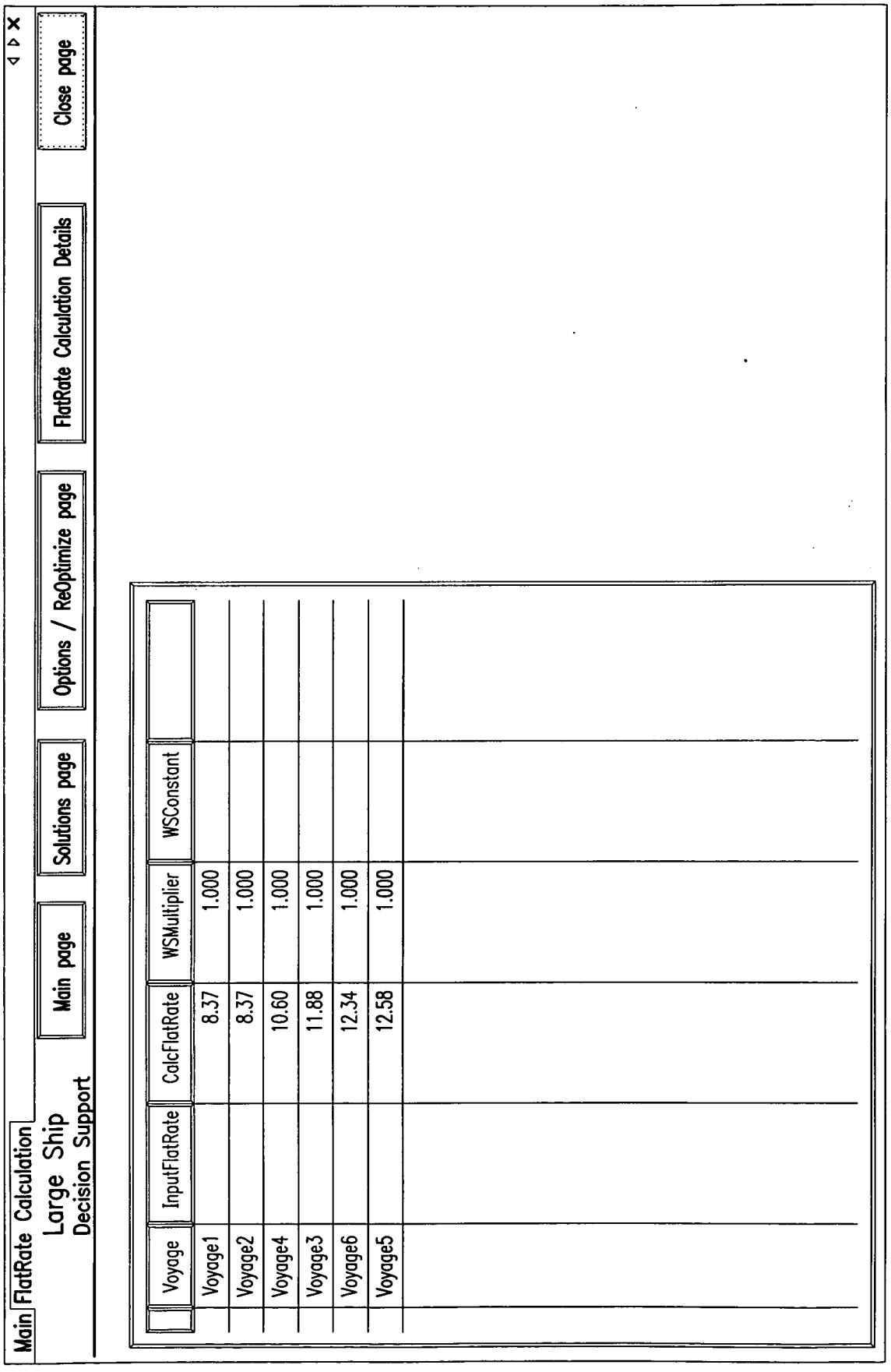
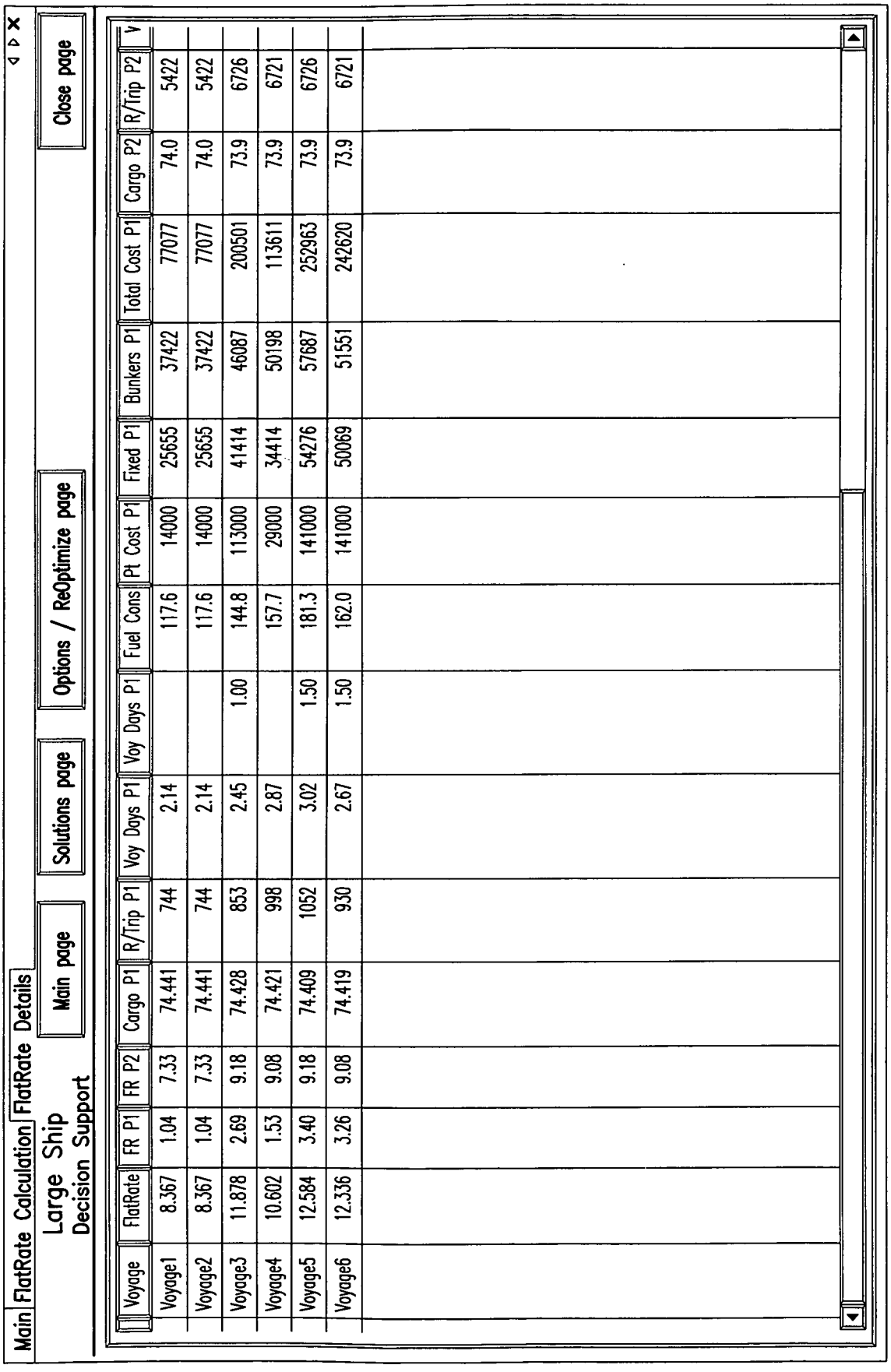
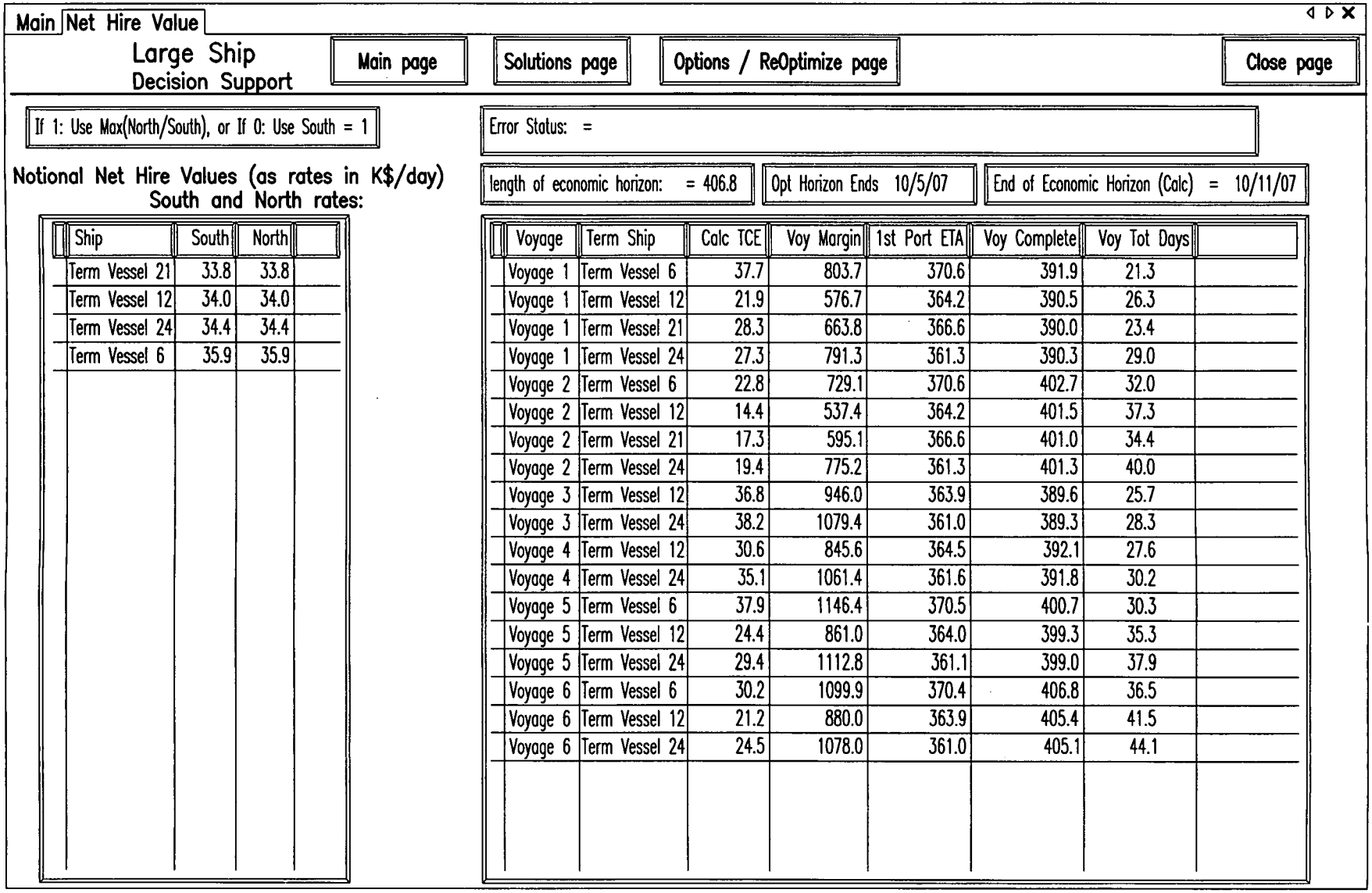

Main
FlatRate Calculation
Large Ship
Decision Support
Main page
Solutions page
Options / ReOptimize page
FlatRate Calculation Details
Close page
Voyage
InputFlatRate
CalcFlatRate
WSMultiplier
WSConstant
Voyage1
8.37
1.000
Voyage2
8.37
1.000
Voyage4
10.60
1.000
Voyage3
11.88
1.000
Voyage6
12.34
1.000
Voyage5
12.58
1.000

FIG. 3Q



Voyage	FlatRate	FR P1	FR P2	Cargo P1	R/Trip P1	Voy Days P1	Voy Days P1	Fuel Cons	Pt Cost P1	Fixed P1	Bunkers P1	Total Cost P1	Cargo P2	R/Trip P2	V
Voyage1	8.367	1.04	7.33	74.441	744	2.14		117.6	14000	25655	37422	77077	74.0	5422	
Voyage2	8.367	1.04	7.33	74.441	744	2.14		117.6	14000	25655	37422	77077	74.0	5422	
Voyage3	11.878	2.69	9.18	74.428	853	2.45	1.00	144.8	113000	41414	46087	200501	73.9	6726	
Voyage4	10.602	1.53	9.08	74.421	998	2.87		157.7	29000	34414	50198	113611	73.9	6721	
Voyage5	12.584	3.40	9.18	74.409	1052	3.02	1.50	181.3	141000	54276	57687	252963	73.9	6726	
Voyage6	12.336	3.26	9.08	74.419	930	2.67	1.50	162.0	141000	50069	51551	242620	73.9	6721	

FIG. 3R



Ship	South	North
Term Vessel 21	33.8	33.8
Term Vessel 12	34.0	34.0
Term Vessel 24	34.4	34.4
Term Vessel 6	35.9	35.9

Voyage	Term Ship	Calc TCE	Voy Margin	1st Port ETA	Voy Complete	Voy Tot Days
Voyage 1	Term Vessel 6	37.7	803.7	370.6	391.9	21.3
Voyage 1	Term Vessel 12	21.9	576.7	364.2	390.5	26.3
Voyage 1	Term Vessel 21	28.3	663.8	366.6	390.0	23.4
Voyage 1	Term Vessel 24	27.3	791.3	361.3	390.3	29.0
Voyage 2	Term Vessel 6	22.8	729.1	370.6	402.7	32.0
Voyage 2	Term Vessel 12	14.4	537.4	364.2	401.5	37.3
Voyage 2	Term Vessel 21	17.3	595.1	366.6	401.0	34.4
Voyage 2	Term Vessel 24	19.4	775.2	361.3	401.3	40.0
Voyage 3	Term Vessel 12	36.8	946.0	363.9	389.6	25.7
Voyage 3	Term Vessel 24	38.2	1079.4	361.0	389.3	28.3
Voyage 4	Term Vessel 12	30.6	845.6	364.5	392.1	27.6
Voyage 4	Term Vessel 24	35.1	1061.4	361.6	391.8	30.2
Voyage 5	Term Vessel 6	37.9	1146.4	370.5	400.7	30.3
Voyage 5	Term Vessel 12	24.4	861.0	364.0	399.3	35.3
Voyage 5	Term Vessel 24	29.4	1112.8	361.1	399.0	37.9
Voyage 6	Term Vessel 6	30.2	1099.9	370.4	406.8	36.5
Voyage 6	Term Vessel 12	21.2	880.0	363.9	405.4	41.5
Voyage 6	Term Vessel 24	24.5	1078.0	361.0	405.1	44.1

FIG. 3S

Main | Lift

Large Ship
Decision Support

Main page | Solutions page | Close page

Minimum and maximum lifts (kT) by voyage

voy	Min	Max
Voyage3	278	284
Voyage5	273	286
Voyage6	260	287
Voyage1	262	288
Voyage2	262	288
Voyage4	268	288

Optimized lifts for possible ship–voyage pairs

	Min kT	Max kT	Lift/Tonnage Term Vessel 6	Term Vessel 12	Term Vessel 21	Term Vessel 24	TBN VLCC #1
Voyage1	262	288	280.2	273.1	262.5	283.6	287.5
Voyage2	262	288	280.2	273.1	262.5	283.6	287.5
Voyage3	278	284		284.0		277.9	
Voyage4	268	288		281.3		287.1	287.7
Voyage5	273	286	279.9	272.8		278.9	286.2
Voyage6	260	287	283.9	281.3		279.6	286.7

FIG. 3T

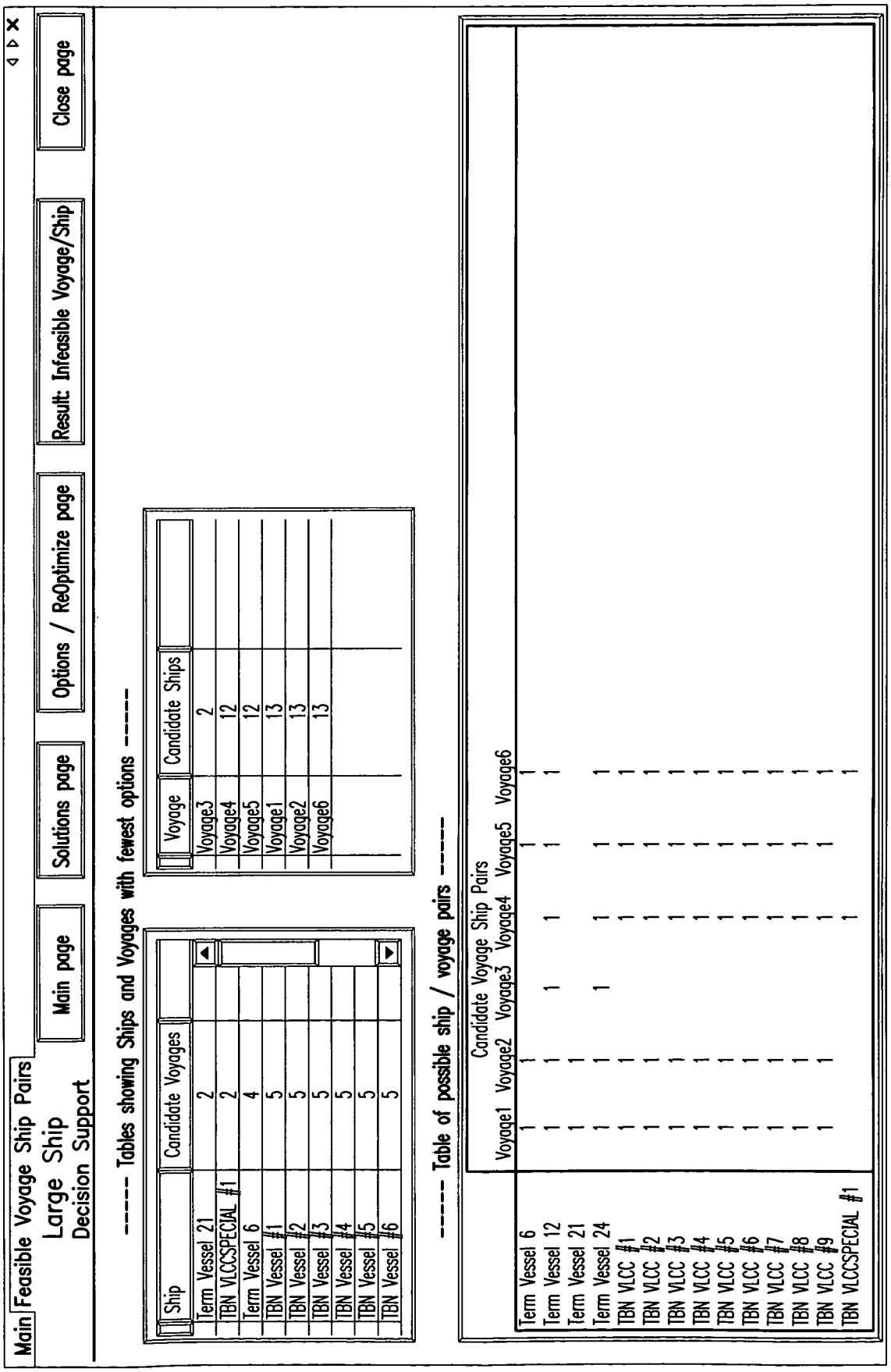

Main
Feasible Voyage Ship Pairs
Large Ship
Decision Support
Main page
Solutions page
Options / ReOptimize page
Result: Infeasible Voyage/Ship
Close page
----- Tables showing Ships and Voyages with fewest options -----
Ship
Candidate Voyages
Term Vessel 21 2
TBN VLCCSPECIAL #1 2
Term Vessel 6 4
TBN Vessel #1 5
TBN Vessel #2 5
TBN Vessel #3 5
TBN Vessel #4 5
TBN Vessel #5 5
TBN Vessel #6 5
Voyage
Candidate Ships
Voyage3 2
Voyage4 12
Voyage5 12
Voyage1 13
Voyage2 13
Voyage6 13
----- Table of possible ship / voyage pairs -----
Candidate Voyage Ship Pairs
Voyage1 Voyage2 Voyage3 Voyage4 Voyage5 Voyage6
Term Vessel 6 1 1 1 1
Term Vessel 12 1 1 1 1 1 1
Term Vessel 21 1 1 1 1
Term Vessel 24 1 1 1 1 1 1
TBN VLCC #1 1 1 1 1 1 1
TBN VLCC #2 1 1 1 1 1 1
TBN VLCC #3 1 1 1 1 1 1
TBN VLCC #4 1 1 1 1 1 1
TBN VLCC #5 1 1 1 1 1 1
TBN VLCC #6 1 1 1 1 1 1
TBN VLCC #7 1 1 1 1 1 1
TBN VLCC #8 1 1 1 1 1 1
TBN VLCC #9 1 1 1 1 1 1
TBN VLCCSPECIAL #1 1 1

FIG. 3U

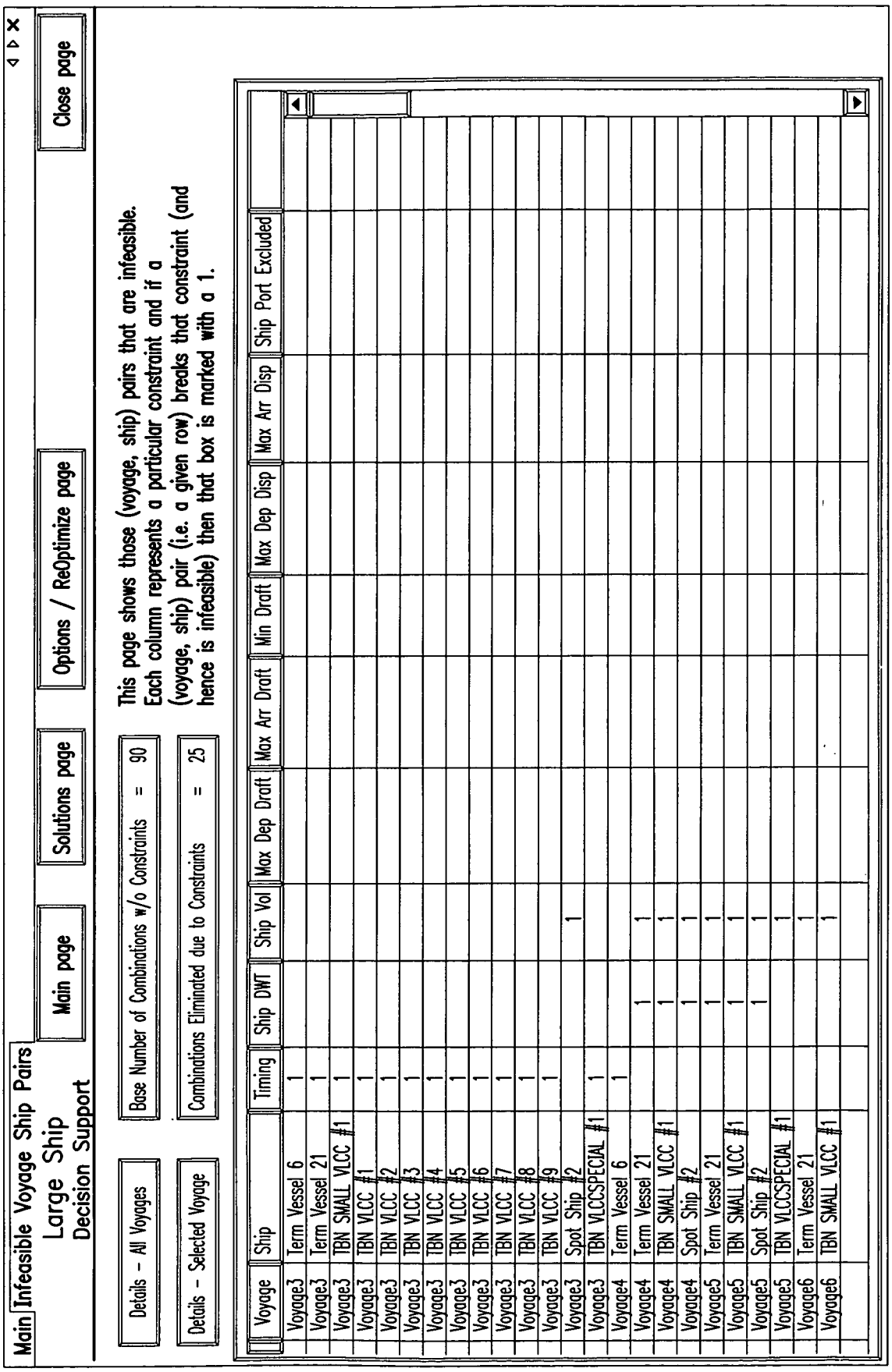

Main
Infeasible Voyage Ship Pairs
Large Ship Decision Support
Main page
Solutions page
Options / ReOptimize page
Close page
Details - All Voyages
Details - Selected Voyage
Base Number of Combinations w/o Constraints = 90
Combinations Eliminated due to Constraints = 25
This page shows those (voyage, ship) pairs that are infeasible.
Each column represents a particular constraint and if a (voyage, ship) pair (i.e. a given row) breaks that constraint (and hence is infeasible) then that box is marked with a 1.
Voyage
Ship
Timing
Ship DWT
Ship Vol
Max Dep Draft
Max Arr Draft
Min Draft
Max Dep Disp
Max Arr Disp
Ship Port Excluded
Voyage3 Term Vessel 6 1
Voyage3 Term Vessel 21 1
Voyage3 TBN SMALL VLCC #1 1
Voyage3 TBN VLCC #1 1
Voyage3 TBN VLCC #2 1
Voyage3 TBN VLCC #3 1
Voyage3 TBN VLCC #4 1
Voyage3 TBN VLCC #5 1
Voyage3 TBN VLCC #6 1
Voyage3 TBN VLCC #7 1
Voyage3 TBN VLCC #8 1
Voyage3 TBN VLCC #9 1
Voyage3 Spot Ship #2 1
Voyage3 TBN VLCCSPECIAL #1 1
Voyage4 Term Vessel 6 1
Voyage4 Term Vessel 21 1 1
Voyage4 TBN SMALL VLCC #1 1 1
Voyage4 Spot Ship #2 1 1
Voyage5 Term Vessel 21 1 1
Voyage5 TBN SMALL VLCC #1 1 1
Voyage5 Spot Ship #2 1 1
Voyage5 TBN VLCCSPECIAL #1 1
Voyage6 Term Vessel 21 1
Voyage6 TBN SMALL VLCC #1 1

FIG. 3V

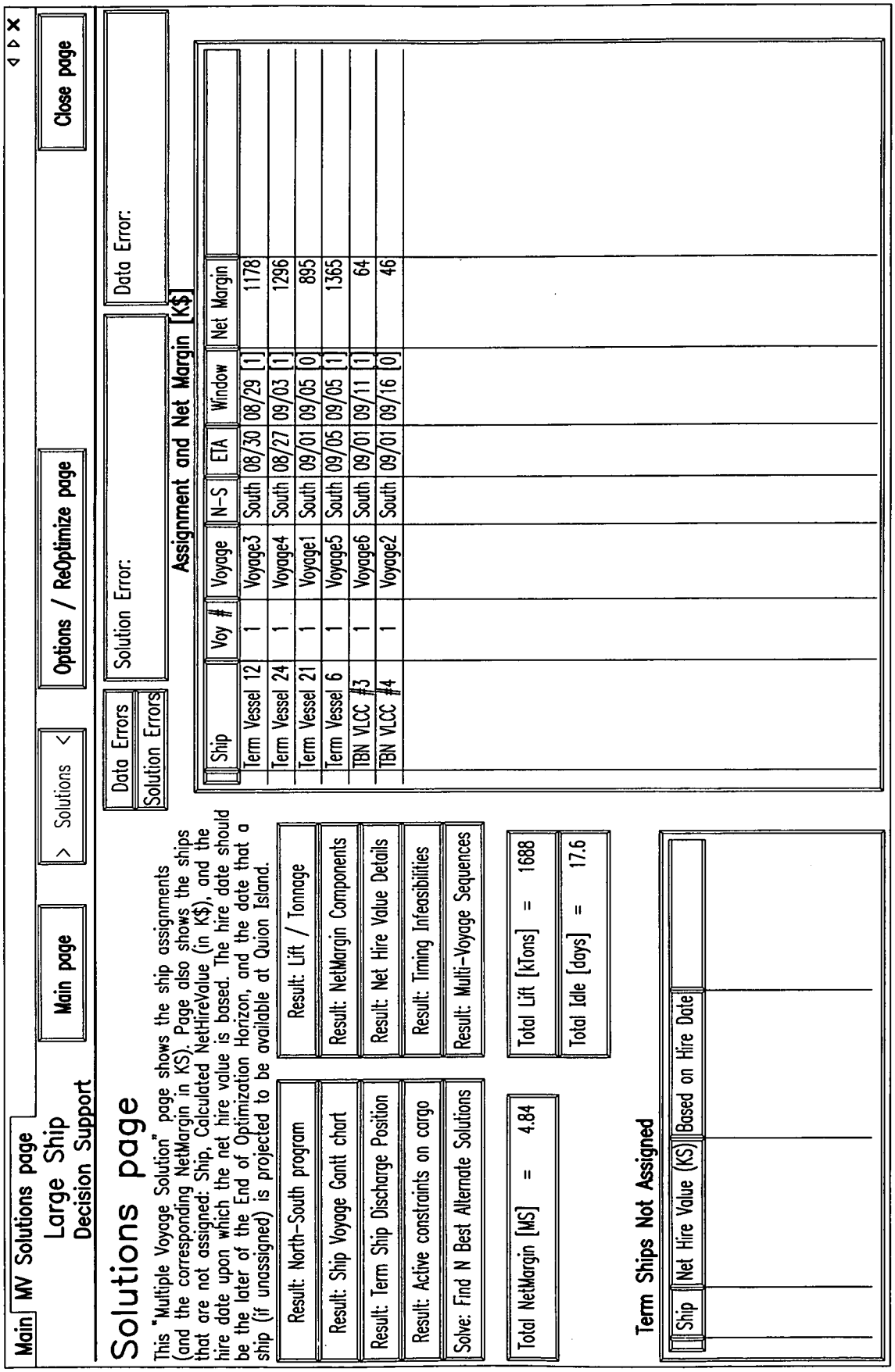

Main
MV Solutions page
Large Ship
Decision Support
Main page
> Solutions <
Options / ReOptimize page
Close page
Solutions page
This "Multiple Voyage Solution" page shows the ship assignments (and the corresponding NetMargin in K$). Page also shows the ships that are not assigned: Ship, Calculated NetHireValue (in K$), and the hire date upon which the net hire value is based. The hire date should be the later of the End of Optimization Horizon, and the date that a ship (if unassigned) is projected to be available at Quion Island.
Data Errors
Solution Errors
Solution Error:
Data Error:
Assignment and Net Margin [K$]
Ship
Voy #
Voyage
N-S
ETA
Window
Net Margin
Term Vessel 12 1 Voyage3 South 08/30 08/29 [1] 1178
Term Vessel 24 1 Voyage4 South 08/27 09/03 [1] 1296
Term Vessel 21 1 Voyage1 South 09/01 09/05 [0] 895
Term Vessel 6 1 Voyage5 South 09/05 09/05 [1] 1365
TBN VLCC #3 1 Voyage6 South 09/01 09/11 [1] 64
TBN VLCC #4 1 Voyage2 South 09/01 09/16 [0] 46
Result: North-South program
Result: Ship Voyage Gantt chart
Result: Term Ship Discharge Position
Result: Active constraints on cargo
Solve: Find N Best Alternate Solutions
Result: Lift / Tonnage
Result: NetMargin Components
Result: Net Hire Value Details
Result: Timing Infeasibilities
Result: Multi-Voyage Sequences
Total NetMargin [M$] = 4.84
Total Lift [kTons] = 1688
Total Idle [days] = 17.6
Term Ships Not Assigned
Ship
Net Hire Value (K$)
Based on Hire Date

FIG. 3W

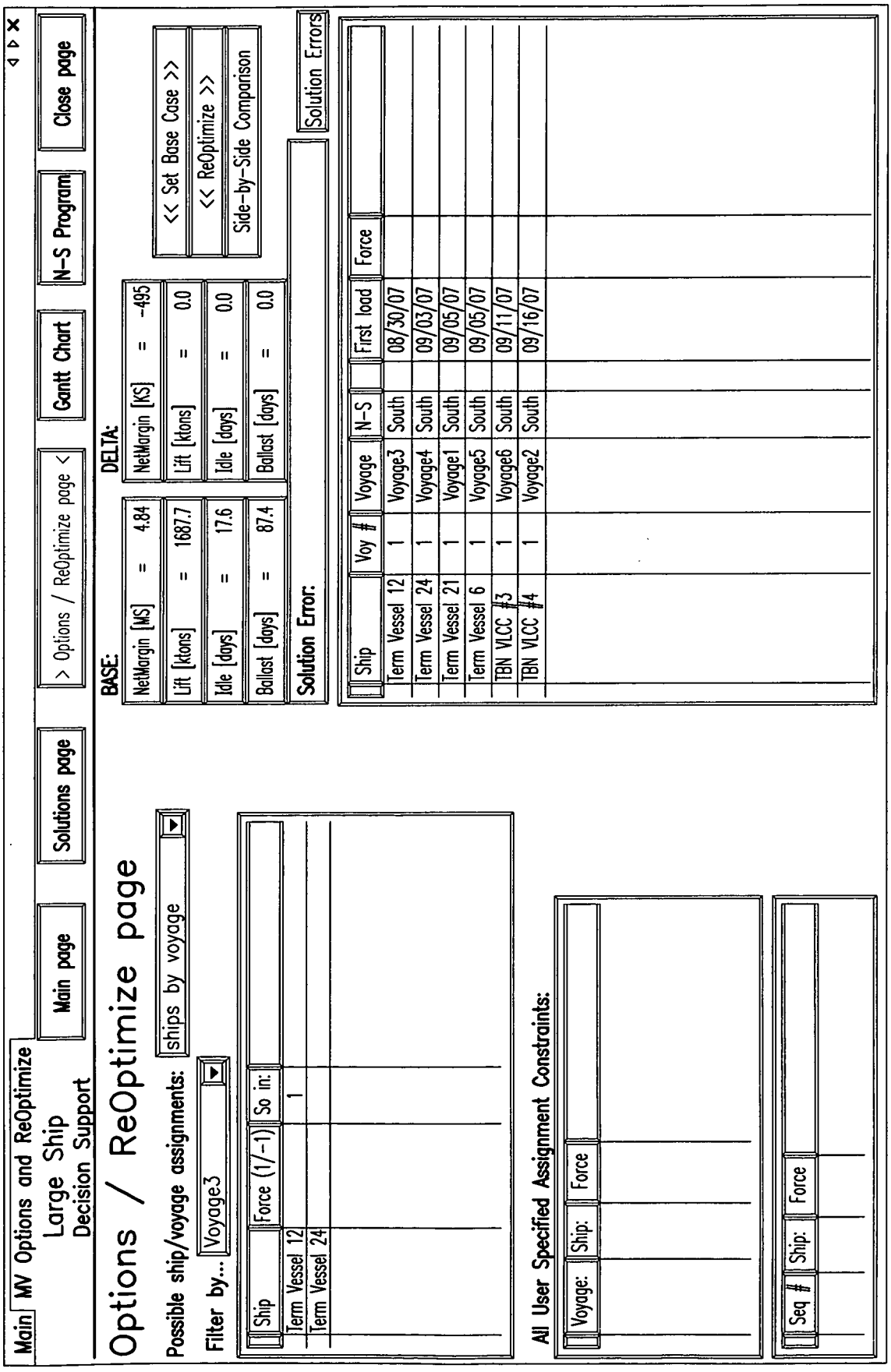

Main
MV Options and ReOptimize
Large Ship
Decision Support
Main page
Solutions page
> Options / ReOptimize page <
Gantt Chart
N-S Program
Close page
Options / ReOptimize page
BASE:
NetMargin [MS] = 4.84
Lift [ktons] = 1687.7
Idle [days] = 17.6
Ballast [days] = 87.4
DELTA:
NetMargin [KS] = -495
Lift [ktons] = 0.0
Idle [days] = 0.0
Ballast [days] = 0.0
<< Set Base Case >>
<< ReOptimize >>
Side-by-Side Comparison
Solution Error:
Solution Errors
Possible ship/voyage assignments:
ships by voyage
Filter by...
Voyage3
Ship
Force (1/-1)
So in:
Term Vessel 12
1
Term Vessel 24
Ship
Voy #
Voyage
N-S
First load
Force
Term Vessel 12
1
Voyage3
South
08/30/07
Term Vessel 24
1
Voyage4
South
09/03/07
Term Vessel 21
1
Voyage1
South
09/05/07
Term Vessel 6
1
Voyage5
South
09/05/07
TBN VLCC #3
1
Voyage6
South
09/11/07
TBN VLCC #4
1
Voyage2
South
09/16/07
All User Specified Assignment Constraints:
Voyage:
Ship:
Force
Seq #
Ship:
Force

FIG. 3X