Titlo	WCE IC	CAOLI	AH LNG FUEL CONVERSION RO	OM ESTIMATE	I	I .		1	1	1	1	I I				
Title	WSF - 15	SAQUA		YLSTON MEETING NOTES FROM 10NOV11 WSF												
Owner:	WSF			DED IN COMMENTS COLUMN.	REV D- ADDS SUBK ENG, DNV, AND TRA	VINING BACK TO EST										
Date:	11-Nov-1	1	INTO. DIN COMMENTS ARE AD	DED IN COMMENTS COLUMN.	REV D- ADDS SOBR EING, DINV, AND TRA	ANING BACK TO EST.										
Spec	SWBS															
Item	GROUP	Craft	SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract Total	abor	Total Material	Total Subcontract	Comments
			Noise and Vibration													
073	0		Requirements	No work.				1					-	\$ -	<u>-</u>	
100	1		Introduction Welding	Info only.									-	\$ - \$ -	\$ - \$ -	
102	l	10	Hull Structure Special	Inio only.									-	\$ -	-	
103	1	0	Requirements	Info only.									-	\$ -	\$ -	
104	1		Bulwarks	No work.									-	\$ -	\$ -	
110	4	1	Shell Plate and Supporting Structure	Modify to accept wat expense	Remove existing shell plate iwo new wet exthaust. Two (2) pc of 74"x84" plate.	Interferences Dine		Dovo	2	18.00			36	¢	\$ -	
110	ı	4	Shell Plate and Supporting	Modify to accept wet exhaust.	Remove existing shell plate iwo new wet	Interferences - Pipe		Days		16.00	-		30	\$ -	-	
110	1	6	Structure	Modify to accept wet exhaust.	exthaust. Two (2) pc of 74"x84" plate.	Interferences - Cable		Days	2	18.00	-		36	\$ -	\$ -	
			Shell Plate and Supporting		Remove existing shell plate iwo new wet			_								
110	1	2	Structure	Modify to accept wet exhaust.	exthaust. Two (2) pc of 74"x84" plate.	Cut, rig & scrap		Days	1	16.00	-		16	\$ -	\$ -	
110	1	2	Shell Plate and Supporting Structure	Modify to accept wet exhaust.	Insert new two (2) 74"x84"x30.6" plate.			Lbs	2,644	0.08	0.85		212	\$ 2,248	\$ -	
110	'	-	Shell Plate and Supporting	Woully to accept wet exhaust.	moer new two (2) 14 xo4 xoo.o plate.			LDS	2,044	0.00	0.00		212	Ψ 2,240	Ψ	
110	1	2	Structure	Modify to accept wet exhaust.	Add 20.4# pipe reinforce brcakets			Lbs	580	0.12	0.85		70	\$ 493	\$ -	
			Shell Plate and Supporting													
110	1	2	Structure	Modify to accept wet exhaust.	Misc add'l foundations ER - Add two (2) long'l bhds for full length			Lbs	645	0.12	0.85		77	\$ 548	\$ -	
					and depth plus one (1) tvs bhd for full length	1										
				Miscellaneous ER structure to support LNG and	and depth for each engine room. 3/8" pl plu											
120	1	2	Hull Structural Bulkheads	Nitrogen modifications	30% stiffs.	Not required.		Lbs	0	-	-		-	\$ -	\$ -	
120	4		Hull Structural Builds	Miscellaneous ER structure to support LNG and	Nitrogen Room - Add approx 28 Ln Ft of			l ba	E 700	0.00750	0.05		EC.4	¢ 4.040	¢	
120	1	12	Hull Structural Bulkheads	Nitrogen modifications Access cut for R/R main engines and local support of	3/8" bhd x 10' w/ 25% stiffs. Remove plate iwo engine. Two (2) pc of 20	+		Lbs	5,783	0.09750	0.85		564	\$ 4,916	-	
130	1	8	Hull Decks	overhead to faciltate rigging out / in of engine.	x 10' plate.	Non-Skid remove		Sq Ft	400	0.03	-		11	\$ -	\$ -	
				Access cut for R/R main engines and local support of	Remove plate iwo engine. Two (2) pc of 20											
130	1	4	Hull Decks	overhead to faciltate rigging out / in of engine.	x 10' plate.	Interferences - Pipe		Days	2	32.00	-		64	\$ -	\$ <u>-</u>	
130	1	6	Hull Decks	Access cut for R/R main engines and local support of overhead to faciltate rigging out / in of engine.	Remove plate iwo engine. Two (2) pc of 20 x 10' plate.	Interferences - Cable		Days	4	24.00			96	\$	\$	
100	<u> </u>	"	Field Doorks	Access cut for R/R main engines and local support of				Days	7	24.00			30	· -	-	
130	1	9	Hull Decks	overhead to faciltate rigging out / in of engine.	x 10' plate.	Interferences - HVAC		Days	3	24.00	-	-	72	\$ -	\$ -	
				Access cut for R/R main engines and local support of				_								
130	1	8	Hull Decks	overhead to faciltate rigging out / in of engine.	x 10' plate.	Interferences - Insulation		Days	1	24.00			24	\$ -	\$ -	
130	1	2	Hull Decks	Access cut for R/R main engines and local support of overhead to faciltate rigging out / in of engine.	x 10' plate.	Cut, rig & relocate		Days	2	16.00	_		32	\$ -	\$ -	
100	'	-	Trui Decks	Access cut for R/R main engines and local support of				Days		10.00			32	Ψ	Ψ	
130	1	2	Hull Decks	overhead to faciltate rigging out / in of engine.	x 10' plate.			Lbs	11,016	0.08	0.15		881	\$ 1,652	\$ -	
			l <u></u> .	Access cut for R/R main engines and local support of				0.5				40.50				
130	1	8	Hull Decks	overhead to faciltate rigging out / in of engine. Access cut for R/R main engines and local support of	Clean and Paint	Non-Skid repair iwo access cuts.		Sq Ft	600	-	-	12.50	-	\$ -	\$ 7,500.00	1
130	1	4	Hull Decks	overhead to facilitate rigging out / in of engine.	Reinstall Interferences	Interferences - Pipe		Days	3	32.00	_		96	s -	\$ -	
		<u> </u>	Trail Decree	Access cut for R/R main engines and local support of		The state of the s		Dayo	Ū	02.00				*	¥	
130	1	6	Hull Decks	overhead to faciltate rigging out / in of engine.	Reinstall Interferences	Interferences - Cable		Days	5	24.00	-		120	\$ -	\$ -	
400				Access cut for R/R main engines and local support of		Later frame and LIN (A.C.		D		04.00			00	•	•	
130	1	9	Hull Decks	overhead to faciltate rigging out / in of engine. Access cut for R/R main engines and local support of	Reinstall Interferences	Interferences - HVAC		Days	4	24.00	-	-	96	\$ -	\$ -	
130	1	8	Hull Decks	overhead to faciltate rigging out / in of engine.	Reinstall Interferences	Interferences - Insulation		Days	2	24.00			48	\$ -	\$ -	
					Install additional structure in overhead,										*	
			l <u></u> .	Access cut for R/R main engines and local support of						400.00	4 000 00			40.500	•	
130 140	1		Hull Decks Hull Platforms and Flats	overhead to faciltate rigging out / in of engine. No work.	arrangements.			ST N/A	7.5 0	120.00	1,800.00	-	900		•	
140	'	+-	וויייייייייייייייייייייייייייייייייייי	Modify for LNG tank foundations / local		+		IN/A	U	-	-	-	-	Ψ -	Ψ <u>-</u>	
150	1	4	Superstructure	strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - Pipe		Days	1.0	20.00	-	-	20	\$ -	\$ -	
				Modify for LNG tank foundations / local											_	
150	1	6	Superstructure	strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - Cable		Days	2.0	24.00	-	-	48	\$ -	\$ -	-
150	1	9	Superstructure	Modify for LNG tank foundations / local strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - HVAC		Days	2.0	32.00		_	64	\$ -	\$ -	
. 50	<u> </u>	T		Modify for LNG tank foundations / local		11710		Days	2.0	52.00			34	Ŧ	•	
150	1	8	Superstructure	strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - Insulation		Days	1.0	16.00	-	-	16	\$ -	\$ -	
450		_	Compared to the	Modify for LNG tank foundations / local	Demonals in a COL COL COL	Interference Oct.		5	4.0	6.10-				Φ.	Φ.	
150	1	8	Superstructure	strengthening. Modify for LNG tank foundations / local	Removals iwo 20' x 30' area at each end.	Interferences - Ceilings		Days	1.0	24.00	-	-	24	\$ -	-	
150	1	6	Superstructure	strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - Lighting		Days	1.0	12.00	_	_	12	\$ -	\$ -	
				Modify for LNG tank foundations / local												
150	1	6	Superstructure	strengthening.	Removals iwo 20' x 30' area at each end.	Interferences - Speakers, etc		Days	1.0	12.00	-	-	12	\$ -	\$ <u>-</u>	
				Modify for LNG tank foundations / local	Install additional structure in overhead, trusses, pillars, etc for support of LNG Tank	.										
150	1	2	Superstructure	strengthening.	Skids at each end.	Steel work		Lbs	36,000	0.15	0.85	_	5,220	\$ 30,600	\$ -	
	<u> </u>			Fabricate structure for heat exchanger on Nav Bridge												
151	1	2	Heat Exchanger / Pump Room	Deck	Fabricate & install	Allow 10 ST each side		Lbs	40,000	0.0525	0.85	-	2,100	\$ 34,000	\$ -	
					Provide drip tray with approx footprint of 67											
160	1	2	Special Structures	Install LNG tank skids and cryogenic drips trays.	Sq Ft of 3/8" stainless material at each end with required support.			Lbs	27,884	0.12	4.00		3,346	\$ 111,537	\$ -	
160			Special Structures	Install LNG tank skids and cryogenic drips trays.	Drain line included in drains.			NSP	0	0.12	4.00	-	3,340			
					Install foundations for LNG skids on house										*	
160	1	2	Special Structures	Install LNG tank skids and cryogenic drips trays.	top.			ST	5	120.00	1,700.00	-	600	\$ 8,500	\$ -	
170	4	2	Masts, Kingposts, and Service Platforms	Add Mast Vent	30' plus weight for supports, foundations,			LBS	520	0.13	0.85		65	¢ 457	\$ -	
170 180	1		Foundations	Modify for RRM Bergen engines.	Remove existing foundations iwo EMD.	Layout area for removal		Days	538 1	0.12 40.00			65 40	\$ 457 \$ -		
180		2	Foundations	Modify for RRM Bergen engines.	Remove existing foundations iwo EMD.	Interferences - Pipe		Days	3	32.00			96		*	
180	1		Foundations	Modify for RRM Bergen engines.	Remove existing foundations iwo EMD.	Interferences - Cable		Days	2	24.00			48		*	
180	1		Foundations	Modify for RRM Bergen engines.	Remove existing foundations iwo EMD.	Interferences - Lighting		Days	2	24.00			48			
180	1	2	Foundations	Modify for RRM Bergen engines.	Remove existing foundations iwo EMD.	Interferences - Grating		Days	1 1	30.00			30	\$ -	\$ -	

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le	WSF - IS	SAQUA	AH LNG FUEL CONVERSION RO		-											
ner:	WSF		REV C - INCORPORATES JBO' MTG. DN COMMENTS ARE AD	YLSTON MEETING NOTES FROM 10NOV11 WSF DED IN COMMENTS COLUMN.	REV D- ADDS SUBK ENG, DNV, AND TR	AINING BACK TO EST.										
:	11-Nov-1	1														
pec em	SWBS GROUP	Craft	SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract	Total Labor	Total Material	Total Subcontract	Comments
						Fabricate and install in-place two (2)										
400	_		Face defices	Mark's supply Brown and a	Lastell and Considering Con DDM and a	new foundation assuming 12ST per		1.00	40.000	0.0005	0.05		4 440	# 40.000	•	
180	1	2	Foundations	Modify for RRM Bergen engines.	Install new foundation for RRM engine.	foundation and inner bottom support. Accuracy control for S/Y AC and		LBS	48,000	0.0925	0.85		4,440	\$ 40,800	<u> </u>	
180	1	2	Foundations	Modify for RRM Bergen engines.	Install new foundation for RRM engine.	consultant.		Days	40	16.00	_	750.00	640	\$ -	\$ 30,000.00	
180	1		Foundations	Modify for RRM Bergen engines.	Install new foundation for RRM engine.	Interferences - Pipe		Days	3	32.00		7.00.00	96	\$ -	:	
180	1		Foundations	Modify for RRM Bergen engines.	Install new foundation for RRM engine.	Interferences - Cable		Days	2	24.00			48	\$ -	\$ -	
180	-	_	Foundations	Modify for RRM Bergen engines.	Install new foundation for RRM engine.	Interferences - Lighting		Days	1	24.00			24		7	
180 200			Foundations Propulsion Systems Equipment	Modify for RRM Bergen engines. Purchase LNG Diesel and Skids	Install new foundation for RRM engine.	Interferences - Grating		Days Lot	3	20.00	7,740,000.00		60			
200		5	Propulsion Systems, Equipment	Purchase Ling Dieser and Skids				LOI		-	7,740,000.00	-	-	\$ 7,740,000	-	
						Remove two (2) engines, rig, and										
230	2	5	Propulsion Engines	Remove existing & replace with RRM.	Remove existing EMD.	dispose. Lifting fixture included in I-160.		Days	5	80.00	1,500.00	-	400	\$ 7,500	\$ -	
						Install two (2) RRM engines, including		_								
230	2	5	Propulsion Engines	Remove existing & replace with RRM.	Install new RRM engine.	setting and installing.		Days	10	80.00			800	\$ -	\$ -	
						Install loose items as quoted by RRM. Associated distributive systems										
230	2	5	Propulsion Engines	Remove existing & replace with RRM.	Install new RRM engine.	included in the specific systems.		Ea	35	24.00			840	\$ -	\$ -	
		<u> </u>	1 Topulatori Eriginea	Remove existing a replace with retwin.	mstail new retrivi engine.	included in the specific systems.		La	- 55	24.00			040	Ψ	Ψ	
						Align includes S/Y personnel for										
						ME/Red Gr interface. Does not include										
242	2	5	Propulsion Shafting	Re-align with RRM engines.	Align new RRM engines to existing shaft	alignment of the existing shafting.		Days	10	50.00	-	-	500	\$ -	\$ -	
						Includes outside engineering /										
						consultant for alignment procedure and			1							
242	2	_	Propulsion Shafting	Re-align with RRM engines.	Align new RRM engines to existing shaft	tech oversite during alignment of ME/Red Gr		Lot	4			25,000.00	_	¢	\$ 25,000.00	
42		5	Propulsion Sharting	Re-aligh with KRW engines.	Aligh new KRIVI engines to existing shart	Check alignment of existing shafting		LOI	<u> </u>	-	-	25,000.00	-	Ф -	\$ 25,000.00	
						system due to new innnerbottom										
12	2	5	Propulsion Shafting	Re-align with RRM engines.	Shaft alignment	structure, hull loading, etc.		Days	4	40.00	_	-	160	\$ -	\$ -	
								1								
						Analyze alignment due to incorporation			1							
42	2	5	Propulsion Shafting	Re-align with RRM engines.	Shaft alignment	of RRM engines and new hull loading.		Lot	1	-	-	25,000.00	-	\$ -	\$ 25,000.00	
						Allow for adjustments based on		_								
242	2		Propulsion Shafting	Re-align with RRM engines.	Shaft alignment	alignment checks and analysis.		Days	15	40.00		1,750.00	600	\$ -	\$ 26,250.00	
12	2	5	Propulsion Shafting	Re-align with RRM engines.	Shaft alignment Remove existing inclusive of exhaust &	Chockfast		Lot	1	-	7,500.00	-	-	\$ 7,500	\$ -	
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	dispose.	90' of 24" pipe and fittings		In Ft	2.160	0.20	_	_	432	\$ -	¢ -	
J3		-	Exhaust System	Remove existing & replace with wet exhaust.	Remove existing inclusive of exhaust &	30 of 24 pipe and fittings		IIII	2,100	0.20	_	-	432	Ψ -	Ψ -	
59	2	8	Exhaust System	Remove existing & replace with wet exhaust.	dispose.	Insulation		Sq Ft	13,565	0.02	_	-	271	\$ -	\$ -	
				3 1 1	Remove existing inclusive of exhaust &				-,					*	•	
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	dispose.	Hangers		Ea	20	12.00	-	-	240	\$ -	\$ -	
					Install new wet exhaust system with new											
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	pipe.	20", A-53, Sch 10, Pipe		In Ft	2,000	0.25	167.45		500	\$ 334,900	\$ -	
	2		Fuhaust Custom	Danas a scietica 8 santas critta cost actual	Install new wet exhaust system with new	2011 Value Butterfly Luc		Ea	2	40.00	2.000.00		32	\$ 4.000	•	
:59		4	Exhaust System	Remove existing & replace with wet exhaust.	pipe. Install new wet exhaust system with new	20", Valve, Butterfly, Lug		Ea		16.00	2,000.00		32	\$ 4,000	\$ -	
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	pipe.	20", Flange, SO, A-105		Ea	12	16.00	47.00		192	\$ 564	\$ -	
			Exhaust Cystem	Tromovo oxioling a replace with wet exhaust.	Install new wet exhaust system with new	20 ; 1 lange; 00; 7(100		Lu	1.2	10.00	-11.00		102	Ψ 001	Ψ	
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	pipe.	20", Expansion Joint		Ea	2	16.00	5,000.00		32	\$ 10,000	\$ -	
				•	Install new wet exhaust system with new						,			,		
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	pipe.	Muffler, supplied by RRM		Ea	2	120.00	100.00		240	\$ 200	\$ -	
					Install new wet exhaust system with new			_								
59	2	4	Exhaust System	Remove existing & replace with wet exhaust.	pipe.	Hangers		Ea	6	24.00	150.00		144	\$ 900	\$ -	
59	2		Exhaust System	Remove existing & replace with wet exhaust.	Install new wet exhaust system with new	Insulation		۶ ₀ ۲	523	0.20	6.00		105	\$ 3,140	\$ -	
59 59	2		Exhaust System Exhaust System	Remove existing & replace with wet exhaust. Remove existing & replace with wet exhaust.	pipe. 6" Air Vent to Main Deck	6", A-53, Sch 40 plus fittings	1	Sq Ft In Ft	210	0.20			105 137			
59 59	2		Exhaust System	Remove existing & replace with wet exhaust. Remove existing & replace with wet exhaust.	0.75" Water Supply to Muffler	0.75", A-53, Sch 40 plus fittings		In Ft	75	1.00			75			
59			Exhaust System	Remove existing & replace with wet exhaust.	2" Drain Line & Valve	0.5", A-53, Sch 40 plus fittings		In Ft	200	0.65	1.20		130			
9	2	4	Exhaust System	Remove existing & replace with wet exhaust.	6" Air Vent to Main Deck	Valves		Ea	2	6.00	450.00		12	\$ 900	\$ -	
9	2	4	Exhaust System	Remove existing & replace with wet exhaust.	0.75" Water Supply to Muffler	Valves		Ea	6	1.00	50.00		6	\$ 300	\$ -	-
9	2	4	Exhaust System	Remove existing & replace with wet exhaust.	2" Drain Line & Valve	Valves		Ea	6	1.00	250.00		6	\$ 1,500	\$ -	
	_	1 _			No work on existing systems except as									•	•	
01	3	6	Electrical, General	Info only.	defined herein.			N/A	1				-	\$ -	\$ -	
)2	3	6	Electric Motors and Equipment	Info only.	No work on existing systems except as defined herein.			N/A	1				_	\$ -	\$ -	
,_	3	U	Protective Devices for Electrical		No work on existing systems except as	+		IN/A					-	Ψ -	-	
3	3	6	Circuits	Info only.	defined herein.			N/A	1				-	\$ -	\$ -	
•		Ť		Allowance to re-route depending on routing of new					1							
				pipe systems as well as removals in superstructure	Re-route on deckhouse top / superstructure	e			1							
4	3	6	Electric Cable & Cableways	iwo LNG tank skids.	area due to Ing skids.			LF	2,500	0.12	3.00		300	\$ 7,500	\$ -	
				Allowance to re-route depending on routing of new												
	_	1 _	5 1	pipe systems as well as removals in superstructure	Re-route on deckhouse top / superstructure				1 .					•	•	
4	3	6	Electric Cable & Cableways	iwo LNG tank skids.	area due to Ing skids.	boxes, etc	1	Lot	1	100.00	5,000.00		100	\$ 5,000	\$ -	
				Allowance to re-route depending on routing of new	Po route existing cable trave is subsect	Allow thirty (30) cable runs of 150' each			1							
24	2	6	Floatria Cable & Cable	pipe systems as well as removals in superstructure	Re-route existing cable trays in exhaust	from MCC to Elec Room, Fan Rooms,		LF	4.500	0.30	6.00		1.050	\$ 27.000	¢	
4	3	6	Electric Cable & Cableways	iwo LNG tank skids. Allowance to re-route depending on routing of new	trunks to alternate location.	and Em Swbd.	+	LF.	4,500	0.30	6.00		1,350	φ 27,000	· -	
				pipe systems as well as removals in superstructure												
)4	3	6	Electric Cable & Cableways	iwo LNG tank skids.	Re-locate lighting in exhaust trunks.			Ea	15	8.00	20.00		120	\$ 300	\$ -	
		<u> </u>		Allowance to re-route depending on routing of new						0.00	20.00		120			
				pipe systems as well as removals in superstructure	Re-locate in engine room due to machinery	Allow fifteen (15) circuits on seven (7)			1							
04	3	6	Electric Cable & Cableways	iwo LNG tank skids.	re-arrangements	panels with 65' per run.		LF	6,825	0.25	5.00		1,706	\$ 34,125	\$ -	
				Allowance to re-route depending on routing of new												
				pipe systems as well as removals in superstructure	Add electrical service to LNG tank room											
04	3	6	Electric Cable & Cableways	iwo LNG tank skids.	power panel.		1	LF	500	0.30	2.00		150	\$ 1,000	\$ -	

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tle	WSF - IS	SAQL	JAH LNG FUEL CONVERSI	ON ROM ESTIMATE 5 JBOYLSTON MEETING NOTES FROM 10NOV11 WSF						-						
ner: e:	WSF 11-Nov-1	1		E ADDED IN COMMENTS COLUMN.	REV D- ADDS SUBK ENG, DNV, AND TRA	AINING BACK TO EST.										
pec tem	SWBS GROUP		ft SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract	Total Labor	Total Material	Total Subcontract	Comments
0.4			Floatric Cable 9 Cableman	Allowance to re-route depending on routing of new pipe systems as well as removals in superstructure	Add electrical service to four (4) gas trunk			IF	600	0.20	2.00		400	ф 4.000	Φ.	
304	3	6	License Gabie a Gabiena		blowers / fans. No work on existing systems except as				600	0.30	2.00		180		-	
311	3	6	Ship Service Power Gene	ation No work. Add UPS for RRM Automation & Gas Control	defined herein.			N/A	0	-	-	-		\$ -	\$ <u>-</u>	
313	3	6	Batteries and Charging	system.	No work on existing systems except as	Includes power cable, install, and racks.		Lot	1	200.00	17,500.00		200	\$ 17,500	\$ -	
314	3	6	General Power Conversion	No work. Add for additional circuits associated with LNG &	defined herein.			N/A	0	-	-	-	-	\$ -	\$ -	
320	3	6	Power Distribution	HVAC systems.	See I-304	List to for a laffer 0 and affect		NSP	0	-	-	-	-	\$ -	\$ -	
				Allow for additional MCC Section required for LNG 8				_								
324	3	6		poards HVAC systems.	ER#2. No work on existing systems except as	breakers.		Ea	2	120.00	10,000.00		240	\$ 20,000	<u>-</u>	
25	3	6	Heat Tracing	No work. Allowance to re-locate depending on routing of new pipe systems as well as removals in superstructure	defined herein.			N/A	0	-	-	-	-	\$ -	\$ <u>-</u>	
31	3	6	Lighting System Distribution		Re-locate lighting in exhaust trunks.			Ea	20	16.00	20.00		320	\$ 400	\$ -	
331	3	6	Lighting System Distribution	pipe systems as well as removals in superstructure	Re-locate lighting in machinery space due to exhaust routing, bilge lighting, etc			Ea	30	16.00	20.00		480	\$ 600	\$ -	
32	3	6	Lighting Systems Fixtures	Allow for "explosion proof" floods on house top iwo LNG tank installation.	Replace existing fixtures on topside superstructure with explosion proof fixtures			Ea	14	12.00	850.00		168	\$ 11,900	\$ -	
110	4			Allow for additional alarm and monitoring points related to gas detection & gas monitoring.	Install additional alarm panels to existing alarm system.			Ea	2	60.00			120	, , , , , , , , , , , , , , , , , , , ,	\$ -	
				Allow for additional alarm and monitoring points	Add additional addressable sensors in tank room, tanks, vent duct, ER & GSU									,,,,,,	ψ - <u>·</u>	
110	4	6		vering related to gas detection & gas monitoring. Allow for additional alarm and monitoring points	enclosure			Ea	34	12.00			408		-	
110	4	6	Vessel Control and Maneu	vering related to gas detection & gas monitoring. Allow for additional alarm and monitoring points	Add cable from sensors to central panel. Modify alarm mimic panel in ECR and 2 x	Allow 125' per circuit.		LF	4,250	0.12	2.00		510	\$ 8,500	-	
110	4	6	Navigation Lights, Signal I	vering related to gas detection & gas monitoring.	bridge. No work on existing systems except as	By subcontractor		Lot	0	-	-	15,000.00	-	\$ -	\$ 15,000.00	
22	4	6	Searchlights and Night Flig Electronic and Acoustic	iht No work.	defined herein. No work on existing systems except as			N/A		-	-	-	-	\$ -	<u>-</u>	
124	4	6	Navigation Systems	No work.	defined herein. No work on existing systems except as			N/A	0	-	-	-	-	\$ -	\$ -	
26	4	6	Electrical Navigation Syste	ms No work.	defined herein. No work on existing systems except as			N/A	0	-	-	-	-	\$ -	\$ -	
127	4	6	Gyrocompasses Centralized Machinery Co	No work. htrol Modify existing controls to integrate RRM controls	defined herein. Basis of estimate is a complete new MAMS			N/A	0	-	-	-	-	\$ -	\$ -	
31	4	6	and Monitoring System Centralized Machinery Co	and LNG monitoring functions.	and Engine Controls.			N/A	0	-	-	-	-	\$ -	\$ -	
131	4	6	and Monitoring System	and LNG monitoring functions.	Provide Consoles - included in RRM quote.			Lot	1	-	-	-		\$ -	\$ -	
131	4	6	Centralized Machinery Co and Monitoring System	ntrol Modify existing controls to integrate RRM controls and LNG monitoring functions.	Install EOS Consoles for control & manouvering. Four (4) total panels.			Days	10	60.00	_	-	600	\$ -	\$ -	
31	4	6	Centralized Machinery Co and Monitoring System	ntrol Modify existing controls to integrate RRM controls and LNG monitoring functions.	Install P/H Consoles for manouvering. Four (4) total panels.			Days	10	24.00	_		240	\$ -	\$ -	
31	4	6	Centralized Machinery Co		Install cable associated with monitoring	Regio in 200 points		LF	13,000	0.08					Φ	
		Ť	Centralized Machinery Co	ntrol Modify existing controls to integrate RRM controls	Purchase & install A&M system for Gas	Basis is 200 points.							1,040			
31	4	6	and Monitoring System Centralized Machinery Co	and LNG monitoring functions. htrol Modify existing controls to integrate RRM controls	Systems. Purchase & install A&M system for Gas	Basis is 48 points.		Lot	1	80.00	-	35,000.00	80	\$ -	\$ 35,000.00	
131	4	6	and Monitoring System Centralized Machinery Co	and LNG monitoring functions. Atrol Modify existing controls to integrate RRM controls	Systems. Purchase & install A&M system for Gas	Console for LNG systems.		Lot	1	-	-	50,000.00	-	\$ -	\$ 50,000.00	
131	4	6	and Monitoring System Interior Communications	and LNG monitoring functions. Extend interior comm to LNG storage tanks and	Systems. Expand existing sound powered phone	Basis is 48 points.		LF	6000	0.08	2.00		480	\$ 12,000	\$ -	
132	4	6	Telephone Systems	bunkering stations.	system.	Central Switch		Lot	1	16.00	5,000.00	-	16	\$ 5,000	\$ -	
132	4	6		Extend interior comm to LNG storage tanks and bunkering stations.	Expand existing sound powered phone system.	Console / booth		Ea	3	12.00	1,800.00	-	36	\$ 5,400	\$ -	
32	4	6	Interior Communications Telephone Systems	Extend interior comm to LNG storage tanks and bunkering stations.	Expand existing sound powered phone system.	Headsets		Ea	3	6.00	650.00	_	18	\$ 1,950	\$ -	
32	4	6	Interior Communications	Extend interior comm to LNG storage tanks and bunkering stations.	Expand existing sound powered phone system.	Speakers		Ea	3	8.00			24			
32	4	6	Interior Communications Telephone Systems	Extend interior comm to LNG storage tanks and bunkering stations.	Expand existing sound powered phone system.	Cable		LF	2000	0.20			400			
39	4	6	Interior Communications	Extend CCTV to LNG storage tanks and bunkering stations.	Expand CCTV system.	Camera		Ea	4	24.00			96			
39	4	6	Interior Communications	Extend CCTV to LNG storage tanks and bunkering stations.	Expand CCTV system.	Cable		LF	600	0.15			90			
41	4	6	Radio Communication Sys	tems No work.				N/A	0	-	-	-	-	\$ -	\$ -	
03		5	Pumps Instruments and Instrumer		Repair / replace those dmaged in			NSP	0	-			-		*	
04 05	5	5 4	Boards, Mechanical General Requirements for and Machinery Piping Sys		modifications. Assign to cryogenic sub.			Lot	1	200.00	5,000.00	-	200	\$ 5,000 \$ -	\$ - \$ -	
								NOD	_					¢.	Φ.	
506 507	5	1	Overflows, Vents, and Sou Machinery and Piping Des and Marking	Install Bleed Vent System Ignation Mark as required.	See I-570 Mark / paint added and modified systems.			NSP Ea	8	32.00	750.00	-	256	\$ - \$ 6,000	\$ - \$ -	
101	J	+	,		wark / paint added and modified systems.			Ed	0	32.00	750.00		200	ψ 6,000	Ψ -	
508	5	8	Insulation and Lagging for Equipment and Machinery		Included in specific systems.								-	\$ -	\$ -	

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tle	WSF - IS	SAQŪ	JAH LNG FUEL CONVERSION RO REV C - INCORPORATES JBO	DM ESTIMATE YLSTON MEETING NOTES FROM 10NOV11 WSF												
ner:	WSF		MTG. DN COMMENTS ARE AD		REV D- ADDS SUBK ENG, DNV, AND TR	RAINING BACK TO EST.										
e: pec	11-Nov-1 SWBS	1														
em	GROUP	Craf		Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract	Total Labor	Total Material	Total Subcontract	Comments
			Thermal Insulation and Acoustic Absorptive Treatment for Ducts		Insulate A-60 the gas line trunks from intal to exhaust, ie two (2) trunks, each	ke										
509	5	8	and Trunks	See specific systems.	approximately 100'x4'x6'.			Sq Ft	4,000	0.15	6.00		600	\$ 24,000	\$ -	
					Remove / relocate ducts, vents, etc in			_							_	
512	5	9	Deckhouse HVAC	Relocate iwo structural mods for LNG foundations. Add fans for gas-free pipe ducts in former exhaust	superstructure and deckhouse tops.			Days	15	48.00	2,000.00		720	\$ 30,000	\$ -	
				uptakes, gas trunk structural support, & HVAC for		Estimate addresses controller,										
513	5	9	Machinery Spaces Ventilation	nitrogen rack room.	Assume 3,000CFM with a low SP.	foundations, etc		Ea	4	64.00	6,500.00		256	\$ 26,000	\$ -	
				Add fans for gas-free pipe ducts in former exhaust uptakes, gas trunk structural support, & HVAC for	Provide additional structure to existing	Assume a support system of spilt tees										
513	5	2	Machinery Spaces Ventilation	nitrogen rack room.	exhaust trunk for ~110psi requirement.	using a WT12x34		Lbs	57,800	0.0825	0.85		4,769	\$ 49,130	\$ -	
				Add fans for gas-free pipe ducts in former exhaust uptakes, gas trunk structural support, & HVAC for	Provide segregated HVAC to Nitrogen											
13	5	9	Machinery Spaces Ventilation	nitrogen rack room.	Room.	SWAG		Lot	1	200.00	7,500.00		200	\$ 7,500	\$ -	
					No work on existing systems except as											
14	5	9	Air Conditioning System Refrigeration Machinery,	No work.	defined herein. No work on existing systems except as			N/A	0	-	-	-	-	\$ -	\$ -	
16	5	9	Equipment and Piping	No work.	defined herein.			N/A	0	-	_	-	-	\$ -	\$ -	
	_		<u>-</u>	Extend sprinkler system to deckhouse top with	0.501	PIPE, SMLS,40S,STAINLESS			450	0.50			00	4 000	•	
21	5	4	Firemain Systems	distribution from existing sprinkler pump. Extend sprinkler system to deckhouse top with	0.50 ln	STEEL,ASTM A312 & FITTINGS PIPE. SMLS.40S.STAINLESS		1.15 LD	150	0.58	8.00		86	\$ 1,200	\$ -	
521	5	4	Firemain Systems	distribution from existing sprinkler pump.	0.75 ln	STEEL,ASTM A312 & FITTINGS		1.15 LD	100	0.86	10.00		86	\$ 1,000	\$ -	
24	-		Firemain Customs	Extend sprinkler system to deckhouse top with	4.00 %	PIPE, SMLS,40S,STAINLESS		4.45.15	400		10.00		445	¢	•	
521	5	4	Firemain Systems	distribution from existing sprinkler pump. Extend sprinkler system to deckhouse top with	1.00 ln	STEEL,ASTM A312 & FITTINGS PIPE, SMLS,40S,STAINLESS		1.15 LD	100	1.15	12.00		115	\$ 1,200	-	
521	5	4	Firemain Systems	distribution from existing sprinkler pump.	1.50 ln	STEEL,ASTM A312 & FITTINGS		1.15 LD	50	1.73	15.00		86	\$ 750	\$ -	
21	5		Firemain Systems	Extend sprinkler system to deckhouse top with	2.00 ln	PIPE, SMLS,40S,STAINLESS		1 15 1 0	50	2.30	20.00		445	¢ 1,000	\$ -	
521	5	4	Firemain Systems	distribution from existing sprinkler pump. Extend sprinkler system to deckhouse top with	Z.00 IN	STEEL,ASTM A312 & FITTINGS PIPE, SMLS,40S,STAINLESS	1	1.15 LD	50	2.30	20.00		115	\$ 1,000	φ -	
521	5	4	Firemain Systems	distribution from existing sprinkler pump.	2.50 ln	STEEL,ASTM A312 & FITTINGS		1.15 LD	50	2.88	30.00		144	\$ 1,500	\$ -	
521	5	1	Firemain Systems	Extend sprinkler system to deckhouse top with distribution from existing sprinkler pump.	Nozzles			Ea	20	2.00	115.00		40	\$ 2.300	\$ -	
1 20	<u> </u>	4	Firemain Systems	Extend to accommodate the added Heat Recovery	INOZZIES			Ea	20	2.00	115.00		40	\$ 2,300	-	
523	5	4	Seawater Cooling Systems	Unit	4.00 ln	CU-FL-SW-FF-CU-NI_04.00_150		1.75 LD	10	7.00	368.41		70	\$ 3,684	\$ -	
523	5	1	Seawater Cooling Systems	Extend to accommodate the added Heat Recovery Unit	4.00 ln	P-SM-CU-NI_04.00_CL200_90-10 - TUBE-CL200 SMLS, CU-NI		1.75 LD	100	7.00	59.69		700	\$ 5,969	\$ -	
720		1	Ocawater Gooling Gystems	Extend to accommodate the added Heat Recovery	4.00 III	TOBE GEZOO GIVIEG, GO IVI		1.73 LD	100	7.00	33.03		700	Ψ 3,505	Ψ	
523	5	4	Seawater Cooling Systems	Unit Control of the Land of th	4.00 ln	Valves		1.75 LD	6	7.00	750.00		42	\$ 4,500	\$ -	
526	5	4	Interior & Deck Drain System	Relocate iwo deckhouse structural mods for LNG foundations.	2.50 ln	45° ELBOW,SCH 40,CS,ASTM A234		1.50 LD	8	3.75	9.00		30	\$ 72	\$ -	
320			michor a Book Brain Gyotom	Relocate iwo deckhouse structural mods for LNG	2.00 m	10 228000,0011 10,00,7010171201		1.00 LD		0.70	0.00		00	72	Ψ	
526	5	4	Interior & Deck Drain System	foundations.	2.50 ln	LATERAL,SCH 40,CS,ASTM A234		1.50 LD	8	3.75	9.00		30	\$ 72	\$ -	
526	5	4	Interior & Deck Drain System	Relocate iwo deckhouse structural mods for LNG foundations.	2.50 In	PIPE, SMLS,SCH 40,CS,ASTM A53		1.50 LD	100	3.75	25.00		375	\$ 2,500	\$ -	
528	5	4	Sanitary Flushing System	Relocate vertical header outside of gas line trunks.	2.50 ln	45° ELBOW,CL200,CuNi,90-10		1.75 LD	12	4.38			53			
528	5	1	Sanitary Flushing System	Delegate vertical bander outside of and line trupks	2.50 ln	PIPE CAP-CLEAN OUT,CL200,CuNi,90)-	1.75 LD	6	4.38	22.00		26	\$ 132	\$ -	
020	5	4	Sanitary Flushing System	Relocate vertical header outside of gas line trunks.	2.50 III	10		1.75 LD	0	4.30	22.00		26	\$ 132	Ф -	
528	5		Sanitary Flushing System	Relocate vertical header outside of gas line trunks.	2.50 In	SEAMLESS PIPE,CL200,CuNi,90-10		1.75 LD	200	4.38			875			
30 31			Fresh Water Systems Watermakers	No work. No work.				N/A N/A	0	-			-	<u> </u>	•	
)J I		+-	Fresh Water Cooling System -	Allow to modify pipe connection; however no new		ELBOW-45 DEG LR-05.00"-STD-CS-		IN/A	0	_			_	Ψ -	<u> </u>	
32.1	5	4	Main Engine	coolers.	5.00 ln	BW		1.75 LD	6	8.75	14.98		53	\$ 90	\$ -	
32.1	5	4	Fresh Water Cooling System - Main Engine	Allow to modify pipe connection; however no new coolers.	5.00 ln	ELBOW-90 DEG LR-05.00"-STD-CS- BW		1.75 LD	6	8.75	23.78		53	\$ 143	\$ -	
			Fresh Water Cooling System -	Allow to modify pipe connection; however no new												
32.1	5	4		coolers.	5.00 ln	FL-SW-RF-CS_05.00_150LB-A105	1	1.75 LD	12	8.75	26.15		105	\$ 314	\$ -	
32.1	5	4	Fresh Water Cooling System - Main Engine	Allow to modify pipe connection; however no new coolers.	5.00 In	P-ERW-CS 05.00 40 A53-B		1.75 LD	100	8.75	15.00		875	\$ 1,500	\$ -	
			Fresh Water Cooling System -	Allow to modify pipe connection; however no new		ELBOW-90 DEG LR-03.00"-STD-CS-								,		
32.1	5	4		coolers.	3.00 ln	BW	1	1.75 LD	5	5.25	5.48		26	\$ 27	\$ -	
32.1	5	4	Fresh Water Cooling System - Main Engine	Allow to modify pipe connection; however no new coolers.	3.00 ln	FL-SW-RF-CS 03.00 150LB-A105		1.75 LD	12	5.25	6.69		63	\$ 80	\$ -	
	-					V-BFY-LUG-DI_03.00_200 PSI-					2.30			30		
32.1	5	4	Fresh Water Cooling System - Main Engine	Allow to modify pipe connection; however no new coolers.	3.00 ln	LEVER_(STAINLESS STEM, BRONZE DISC, EPDM SEAL)		1.75 LD	6	5.25	924.00		32	\$ 5,544	\$	
)Z. I	5	4	тмант стідіне	COUNTS.	3.00 III	V-BFY-WAF-DI_03.00_200 PSI-	+	1./5 LD	0	5.25	924.00		32	ψ 5,544	ψ -	
	_		Fresh Water Cooling System -	Allow to modify pipe connection; however no new		LEVER_(STAINLESS STEM, BRONZE		,	_							
32.1	5	4	Main Engine Fresh Water Cooling System -	coolers. Allow to modify pipe connection; however no new	3.00 In	DISC, EPDM SEAL)	+	1.75 LD	6	5.25	176.24		32	\$ 1,057	\$ -	
2.1	5	4	Main Engine	coolers.	2.00 ln	UNION-02.00"-3000 LB-FS-THD		1.75 LD	10	3.50	20.26		35	\$ 203	\$ -	
			Fresh Water Cooling System -	Allow to modify pipe connection; however no new	2221	ELBOW-90 DEG-02.00"-3000 LB-FS-		4 == : =								
32.1	5	4	Main Engine Fresh Water Cooling System -	coolers. Allow to modify pipe connection; however no new	2.00 ln	SW		1.75 LD	10	3.50	12.36		35	\$ 124	\$ -	
32.1	5	4		coolers.	2.00 ln	FL-SW-FF-CS_02.00_150LB-A105		1.75 LD	12	3.50	8.60		42	\$ 103	\$ -	
	_		Fresh Water Cooling System -	Allow to modify pipe connection; however no new		P-ERW-CS_02.00_40_A53-B - PIPE-										
32.1	5	4	Main Engine Fresh Water Cooling System -	coolers. Allow to modify pipe connection; however no new	2.00 In	SCH 40 ERW	+	1.75 LD	100	3.50	5.00		350	\$ 500	\$ -	
32.1	5	4	Main Engine	coolers.	2.00 ln	TEE-02.00"-3000 LB-FS-SW		1.75 LD	10	3.50	15.21		35	\$ 152	\$ -	
22.4	-	_	Fresh Water Cooling System -	Allow to modify pipe connection; however no new	2 22 1-	VALVE-3 WAY TEMPERATURE		4 75 15	_	0.50	0.500.00		-	¢ 47.000	•	
32.1	5	4	Main Engine Fresh Water Cooling System -	coolers.	2.00 ln	CONTROL-AMOT-2" GEFDJB021-DI	+	1.75 LD	2	3.50	8,500.00		7	\$ 17,000	\$ -	+
532.2	5	5	LNG Systems	Add ppg and cooler as required.	HRU in ER #1 & ER#2			Ea	2	64.00	200.00		128	\$ 400	\$ -	
22.2	_	_	Fresh Water Cooling System -	Add and and cooler as required	Heat Exchanger in Pump Room on									¢	¢	
32.2	5	5	LNG Systems	Add ppg and cooler as required.	Deckhouse			1					-	\$ -	\$ -	

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WSF - ISSAQUAH LNG FUEL CONVERSION REV D (2) Final.xls

Title WSF - ISSA	AQUAH LNG FUEL CONVERSION RO	M ESTIMATE											
_		LSTON MEETING NOTES FROM 10NOV11 WSF											
Owner: WSF Date: 11-Nov-11	MTG. DN COMMENTS ARE ADD	DED IN COMMENTS COLUMN.	REV D- ADDS SUBK ENG, DNV, AND TRA	INING BACK TO EST.									
Spec SWBS													
Item GROUP C	Fresh Water Cooling System -	Brief Scope	Notes 1	Notes 2 Includes foundation, controller, pump &	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract Total Labor	Total Material	Total Subcontract	Comments
532.2 5	5 LNG Systems	Add ppg and cooler as required.	Pump - ER	motor.		Ea	2	40.00	15,000.00	80	\$ 30,000	\$ -	
532.2 5	Fresh Water Cooling System - LNG Systems	Add ppg and cooler as required	Pump - Pump Room	Includes foundation, controller, pump & motor.		Ea	2	40.00	7,500.00	80	\$ 15,000	œ.	
532.2 5	Fresh Water Cooling System -	Add ppg and cooler as required.	Pump - Pump Room	motor.		Еа	2	40.00	7,500.00	00	\$ 15,000	Ф -	
532.2 5	4 LNG Systems	Add ppg and cooler as required.	4.00 ln	PIPE, SMLS,SCH 40,CS,ASTM A53		1.25 LD	400	5.00	12.00	2,000	\$ 4,800	\$ -	
532.2 5	Fresh Water Cooling System - 4 LNG Systems	Add ppg and cooler as required.	4.00 In	ELBOW-90 DEG LR-04.00"-STD-CS- BW		1.25 LD	20	5.00	11.03	100	\$ 221	s -	
	Fresh Water Cooling System -												
532.2 5	4 LNG Systems Fresh Water Cooling System -	Add ppg and cooler as required.	4.00 In	FL-SW-RF-CS_04.00_150LB-A105		1.25 LD	8	5.00	18.67	40	\$ 149	-	
532.2 5	4 LNG Systems	Add ppg and cooler as required.	4.00 ln	Valves		1.25 LD	4	5.00	350.00	20	\$ 1,400	\$ -	
500.0	Fresh Water Cooling System -	A LL L L	0.001	ELBOW-90 DEG LR-06.00"-STD-CS-		4.05.1.0	40	7.50	04.00	0.0		•	
532.2 5	4 LNG Systems Fresh Water Cooling System -	Add ppg and cooler as required.	6.00 In	BW FLANGE SPECIAL - PLATE FLANGE -		1.25 LD	12	7.50	24.32	90	\$ 292	-	
532.2 5	4 LNG Systems	Add ppg and cooler as required.	6.00 ln	6"		1.25 LD	8	7.50	45.00	60	\$ 360	\$ -	
532.2 5	Fresh Water Cooling System - 4 LNG Systems	Add ppg and cooler as required.	6.00 In	P-ERW-CS_06.00_40_A53-B - PIPE- SCH 40 ERW		1.25 LD	160	7.50	18.00	1,200	\$ 2,880	\$ -	
332.2 3	Fresh Water Cooling System -	Add ppg and cooler as required.	0.00 111	SGIT 40 EIKW		1.23 LD	100	7.50	10.00	1,200	Ψ 2,000	-	
532.2 5	4 LNG Systems	Add ppg and cooler as required.	6.00 In	Valves		1.25 LD	4	7.50	425.00	30	\$ 1,700	\$ -	
533 5	4 Potable Water Service System	Relocate vertical header outside of gas line trunks.	2.00 ln	PIPE, SMLS,40S,STAINLESS STEEL,ASTM A312		1.50 LD	200	3.00	27.00	600	\$ 5,400	\$ -	
536 5	4 Hot Water Heating Systems	Relocate vertical header outside of gas line trunks.	2.00 ln	Copper Pipe, B-88, Typ K		1.00 LD	200	2.00	17.00	400	\$ 3,400	\$ -	
	4 Hot Water Heating Systems 4 Hot Water Heating Systems	Relocate vertical header outside of gas line trunks. Relocate vertical header outside of gas line trunks.	2.00 ln 2.00 ln	Flange, 150# Brz SJ Copper El, 90, B-75		1.00 LD 1.00 LD	15 20	2.00	85.00 30.00		\$ 1,275 \$ 600		
	. That water Fleating Gystems		2.00 111			1.00 LD	20	2.00	30.00	40	000	-	
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO		Pipe, CS, Smls, A106, Sch 40, WO									
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	771040	Remove	0.75 LD	75	0.75	_	56	\$ -	\$ -	
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Elbow, FS, SW, 3000#, WO 622107	Remove	0.75 LD	5	0.75	-	4	\$ -	\$ -	
		Remove existing FO service system piping, pumps,											
		etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Tee, FS, SW, 3000#, WO 622121	Remove	0.75 LD	3	0.75	-	2	\$ -	\$ -	
		Remove existing FO service system piping, pumps,											
		etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Union, FS, SCRD, 3000#, WO 621150	Remove	0.75 LD	6	0.75	-	5	-	-	
		Remove existing FO service system piping, pumps,											
E41.1 E	4 Fuel Oil System - Diesel	etc associated with diesel engines. Re-route DO lines to Emergency Generator outside of gas trunk.	1.00 ln	Valve, Gate, ST/ST, SW, 300#, WO 214131	Domous	0.75 D	2	0.75			 \$	\$ -	
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside or gas trunk.	1.00 III	214131	Remove	0.75 LD	2	0.75	-	4		Ф -	
		Remove existing FO service system piping, pumps,											
541.1 5	4 Fuel Oil System - Diesel	etc associated with diesel engines. Re-route DO lines to Emergency Generator outside of gas trunk.	1.00 ln	Valve, Ball, ST/ST, SW, 300#, WO 376331	Remove	0.75 LD	2	0.75	-		- s	s -	
0	. r dei ein eyetenn Biese.			0.000	1101110110	0.70 22		50			<u> </u>		
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Filter, Racor, Estimate	Remove	0.75 LD	2	0.75	-	2	\$ -	\$ -	
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO			1								
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Valve, Check, Thd, 300#, WO 214521	Remove	0.75 LD	4	0.75	-	3	\$ -	\$ -	
		Remove existing FO service system piping, pumps,											
		etc associated with diesel engines. Re-route DO		Pipe, CS, Smls, A106, Sch 40, WO									
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	0.75 ln	771040	Remove	0.75 LD	50	0.56	-	28	-	-	
		Remove existing FO service system piping, pumps,			1								
_	4 5 1 2 2 5 5	etc associated with diesel engines. Re-route DO		FIL	_	0 == : =							
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	0.75 ln	Elbow, FS, SW, 3000#, WO 622107	Remove	0.75 LD	4	0.56	-	2	-	-	
		Remove existing FO service system piping, pumps,			1								
541.1 5	4 Fuel Oil System - Diesel	etc associated with diesel engines. Re-route DO lines to Emergency Generator outside of gas trunk.	0.75 ln	Tee, FS, SW, 3000#, WO 622121	Remove	0.75 LD	6	0.56			 \$	¢	
341.1 5	- Puer On System - Diesel		0.75 III	166, F3, 3vv, 3000#, vvO 622121	remove	0.75 LD	0	0.00	-		φ -	Ψ -	
		Remove existing FO service system piping, pumps,			1								
541.1 5	4 Fuel Oil System - Diesel	etc associated with diesel engines. Re-route DO lines to Emergency Generator outside of gas trunk.	0.75 ln	Union, FS, SCRD, 3000#, WO 621150	Remove	0.75 LD	10	0.56	_	F	\$ -	\$ -	
, ,	2,232			, , , , , , , , , , , , , , , , , , , ,	1			0.03					
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO		Valve, Gate, ST/ST, SW, 300#, WO									
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	0.75 ln	214131 valve, Gate, S1/S1, SW, 300#, WO	Remove	0.75 LD	4	0.56		2	\$ -	\$ -	
		Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	0.75 ln	Valve, Check, Thd, 300#, WO 214521	Remove	0.75 LD	2	0.56	-	1	\$ -	\$ -	
		Remove existing FO service system piping, pumps,											
		etc associated with diesel engines. Re-route DO											
541.1 5	4 Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	0.75 ln	Hose, FO, Connections, Estimate	Remove	0.75 LD	2	0.56	-	1	-	-	

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WSF - ISSAQUAH LNG FUEL CONVERSION REV D (2) Final.xls

Title	WSF - IS	SAQUA	AH LNG FUEL CONVERSION RC	DM ESTIMATE											
		7071407		/LSTON MEETING NOTES FROM 10NOV11 WSF											+
Owner:	WSF		MTG. DN COMMENTS ARE ADI		REV D- ADDS SUBK ENG, DNV, AND T	RAINING BACK TO EST.									
Date:	11-Nov-1		1												
Spec Item	SWBS GROUP		SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract Total Labor	Total Material	Total Subcontract	Comments
			01120 11110	•				0							
				Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO		Pipe, CS, Smls, A106, Sch 40, WO									
541.1	5	4	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	771040	Relocate	1.50 LD	50	1.50	2.40	75	\$ 120	\$ -	
			·												
				Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1	5	4	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Elbow, FS, SW, 3000#, WO 622107	Relocate	1.50 LD	6	1.50	5.00	9	\$ 30	\$ -	
				Demonstration FO consider a state of the constant											
				Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1	5	4	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Tee, FS, SW, 3000#, WO 622121	Relocate	1.50 LD	4	1.50	5.00	6	\$ 20	\$ -	
1				Remove existing FO service system piping, pumps,											
1				etc associated with diesel engines. Re-route DO											
541.1	5	4	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Union, FS, SCRD, 3000#, WO 621150	Relocate	1.50 LD	8	1.50	7.00	12	\$ 56	\$ -	
				Remove existing FO service system piping, pumps,											
544.4	-	,	Fire Oil Content Discol	etc associated with diesel engines. Re-route DO	1.00 ln	Valve, Gate, ST/ST, SW, 300#, WO 214131	Delegate	4.501.0	2	1.50	60.00		r 400	•	
541.1	5	+	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 111	1214131	Relocate	1.50 LD		1.50	00.00	3	\$ 120	Ψ -	+
				Remove existing FO service system piping, pumps,		Valva Ball CT/CT CW 200" WC									
541.1	5	4	Fuel Oil System - Diesel	etc associated with diesel engines. Re-route DO lines to Emergency Generator outside of gas trunk.	1.00 ln	Valve, Ball, ST/ST, SW, 300#, WO 376331	Relocate	1.50 LD	2	1.50	90.00	3	\$ 180	\$ -	
			,				1								
				Remove existing FO service system piping, pumps, etc associated with diesel engines. Re-route DO											
541.1	5	4	Fuel Oil System - Diesel	lines to Emergency Generator outside of gas trunk.	1.00 ln	Valve, Check, Thd, 300#, WO 214521	Relocate	1.50 LD	2	1.50	115.00	3	\$ 230	\$ -	
541.2	5	5	Fuel Oil System - LNG Supply	Install LNG service lines from storage tanks to GSU & diesels.	Install Gas Supply Unit in ER#1 & ER#2	Includes foundations, setting, etc.		Ea	2	120.00	2,000.00	240	\$ 4,000	\$ -	
				Install LNG service lines from storage tanks to GSU							,		,		Pending guidance from Chart
541.2	5	4	Fuel Oil System - LNG Supply	& diesels. Install LNG service lines from storage tanks to GSU	2.50 ln	Pipe & fittings.	+	4.00 LD	50	10.00	85.00	500	\$ 4,250	\$ -	Industries Pending guidance from Chart
541.2	5	4	Fuel Oil System - LNG Supply	& diesels.	2.50 ln	Valves - supplied by Hamworthy		4.00 LD	6	10.00	20.00	60	\$ 120	\$ -	Industries
541.2	5		Fuel Oil System - LNG Supply	Install LNG service lines from storage tanks to GSU & diesels.	2.00 ln	Pipe & fittings.		4.00 LD	275	8.00	100.00	2,200	\$ 27.500	\$	Pending guidance from Chart Industries
541.2	5	4	ruei Oii System - Ling Suppry	Install LNG service lines from storage tanks to GSU	2.00 III	Pipe & Huings.		4.00 LD	2/5	6.00	100.00	2,200	\$ 27,500	-	Pending guidance from Chart
541.2	5	4	Fuel Oil System - LNG Supply	& diesels.	2.00 ln	Valves - supplied by Hamworthy		4.00 LD	6	8.00	20.00	48	\$ 120	\$ -	Industries
541.3	5	4	Fuel Oil System - LNG Bunker Line	Install LNG bunker lines from bunker station to storage tanks.	3.00 ln	Pipe & fittings.		4.00 LD	300	12.00	120.00	3,600	\$ 36,000	\$ -	Pending guidance from Chart Industries
	_		Fuel Oil System - LNG Bunker	Install LNG bunker lines from bunker station to											Pending guidance from Chart
541.3	5	4	Line	storage tanks. Allow modified engine connections. Addition of LO	3.00 ln	Valves - supplied by Hamworthy ELBOW-45 DEG LR-02.00"-STD-CS-		4.00 LD	15	12.00	20.00	180	\$ 300	\$ -	Industries
542.0	5	4	Lubricating Oil Systems	purifier or backflush filter is not included.	2.00 ln	BW		1.50 LD	3	3.00	4.42	9	\$ 13	\$ -	
542.0	5	4	Lubricating Oil Systems	Allow modified engine connections. Addition of LO purifier or backflush filter is not included.	2.00 ln	ELBOW-90 DEG LR-02.00"-STD-CS- BW		1.50 LD	7	3.00	4.53	21	\$ 32	\$ -	
				Allow modified engine connections. Addition of LO									•		
542.0	5	4	Lubricating Oil Systems	purifier or backflush filter is not included. Allow modified engine connections. Addition of LO	2.00 ln	FL-SW-FF-CS_02.00_150LB-A105		1.50 LD	2	3.00	8.60	6	\$ 17	\$ -	_
542.0	5	4	Lubricating Oil Systems	purifier or backflush filter is not included.	2.00 ln	P-SM-CS_02.0_40_A106-B		1.50 LD	150	3.00	4.77	450	\$ 716	\$ -	
542.0	5	1	Lubricating Oil Systems	Allow modified engine connections. Addition of LO purifier or backflush filter is not included.	2.00 ln	Valves		1.50 LD	10	3.00	325.00	30	\$ 3,250	¢	
543	5		Waste Oil Transfer System	Allow modified engine connections.	1.25 ln	CPLG-01.25"-3000 LB-SS-SW		1.50 LD	6	1.88		11	\$ 94		
						ELBOW-45 DEG-01.25"-3000 LB-FS-									<u> </u>
543	5	+ 4	Waste Oil Transfer System	Allow modified engine connections.	1.25 ln	ELBOW-90 DEG LR-01.25"-STD-CS-		1.50 LD	4	1.88	7.82	8	\$ 31	\$ -	
543	5	4	Waste Oil Transfer System	Allow modified engine connections.	1.25 ln	BW		1.50 LD	2	1.88	3.24	4	\$ 6	\$ -	
543	5	4	Waste Oil Transfer System	Allow modified engine connections.	1.25 ln	ELBOW-90 DEG-01.25"-3000 LB-FS- SW		1.50 LD	20	1.88	7.23	38	\$ 145	\$ -	
	_					P-SM-CS_01.25_40_A106 GR-B - PIPE	≣-								
543	5	4	Waste Oil Transfer System	Allow modified engine connections. Allow modified engine connections. Addition, if	1.25 ln	SCH 40 SMLS	+	1.50 LD	150	1.88	3.74	281	\$ 561	\$ -	
	_			required, of increased capacity air compressor is not		ELBOW-45 DEG-01.50"-3000 LB-FS-			_						
551	5	4	Compressed Air System	included. Allow modified engine connections. Addition, if	1.50 ln	SW		1.50 LD	8	2.25	10.00	18	\$ 80	5 -	+
				required, of increased capacity air compressor is not		ELBOW-90 DEG-01.50"-3000 LB-FS-									
551	5	4	Compressed Air System	included. Allow modified engine connections. Addition, if	1.50 ln	SW	+	1.50 LD	53	2.25	8.46	119	\$ 448	\$ -	4
				required, of increased capacity air compressor is not		HOSE-01.50"-AEROQUIP 2651-12-									
551	5	4	Compressed Air System	included.	1.50 ln	SINGLE WIRE-SAE 100R5 HOSE-01.50"-AEROQUIP 2651-12-	1	1.50 LD	2	2.25	260.00	5	\$ 520	\$ -	
				Allow modified engine connections. Addition, if		SINGLE WIRE-SAE 100R5 - HOSE-1									
E	_		Compressed Air Court	required, of increased capacity air compressor is not		1/2"-AEROQUIP 2651-12-SINGLE		15015		0.05	000.00		¢ 4.043	•	
551	5	4	Compressed Air System	included. Allow modified engine connections. Addition, if	1.50 ln	WIRE-SAE 100R5	1	1.50 LD	4	2.25	260.00	9	\$ 1,040	5 -	
	_			required, of increased capacity air compressor is not		P-SM-CS_01.50_40_A106-B - PIPE-									
551 553	5 5		Compressed Air System Nitrogen Systems	included. Install bottles and distributive systems.	1.50 In Install bottle racks / foundations.	SCH 40 SMLS	-	1.50 LD ST	479 1	2.25 120.00		1,078 120			
553			Nitrogen Systems	Install bottles and distributive systems.	Install bottle racks / foundations.			Days	2	16.00		32			
553	5	Δ	Nitrogen Systems	Install bottles and distributive systems.	1.50 ln	ELBOW-45 DEG-01.50"-3000 LB-FS-		1.50 LD	8	2.25	10.00	18	\$ 80	\$ -	
						ELBOW-90 DEG-01.50"-3000 LB-FS-							·		
553	5	4	Nitrogen Systems	Install bottles and distributive systems.	1.50 ln	SW HOSE-01.50"-AEROQUIP 2651-12-		1.50 LD	53	2.25	8.46	119	\$ 448	\$ -	
553	5	4	Nitrogen Systems	Install bottles and distributive systems.	1.50 ln	SINGLE WIRE-SAE 100R5	<u> </u>	1.50 LD	2	2.25	260.00	5	\$ 520	\$ -	
															

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WSF - ISSAQUAH LNG FUEL CONVERSION REV D (2) Final.xls

Title WSF	- ISSAQI	UAH LNG FUEL CONVERSION ROM	M ESTIMATE												
			STON MEETING NOTES FROM 10NOV11 WSF												
Owner: WSF		MTG. DN COMMENTS ARE ADD	ED IN COMMENTS COLUMN.	REV D- ADDS SUBK ENG, DNV, AND TRA	AINING BACK TO EST.										
Date: 11-No															
•	OUP Cra	aft SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract	Total Labor	Total Material	Total Subcontract	Comments
553 5		Nitrogen Systems	Install bottles and distributive systems.	1.50 ln	P-SM-CS_01.50_40_A106-B - PIPE- SCH 40 SMLS		1.50 LD	255	2.25	4.24		574	\$ 1,081	•	
333 3	, 4	Nillogen Systems	install bottles and distributive systems.	1.50 III	ELBOW-90 DEG-00.75"-3000 LB-FS-		1.30 LD	255	2.23	4.24		374	ψ 1,001	<u> </u>	
553 5	i 4	Nitrogen Systems	Install bottles and distributive systems.	0.75 ln	SW SINGS OF THE PROPERTY OF TH		2.00 LD	20	1.50	5.00		30	\$ 100	\$ -	4
553 5	. 4	Nitrogen Systems	Install bottles and distributive systems.	0.75 ln	P-SM-CS_0.75_40_A106-B - PIPE- SCH 40 SMLS		2.00 LD	125	1.50	3.00		188	\$ 375	\$ -	
555 5		Firefighting	Add CO2 iwo bunker stations.	Subcontract scope	OCIT TO CIVILED		Lot	1	80.00		20,000.00	80	\$ -		
504	. _	Combunities Air Contains	Increase existing blower & duct systems to address larger engine HP rating.		SWAG		Lot	1	200.00		45,000.00	200	Φ.	\$ 45,000.00	
561 5	9	Combustion Air Systems	rarger engine HP rating.		SWAG		LOI		300.00	-	45,000.00	300	\$ -	\$ 45,000.00	Pending guidance from Chart
570 5	5 4	Vents, Fills and Sounds	Extend LNG vents to Mast in I-170.	3.00 ln	Pipe & fittings.		4.00 LD	280	12.00	85.00		3,360	\$ 23,800	\$ -	Industries
570 5		Vents, Fills and Sounds	Extend LNG vents to Mast in I-170.	3.00 ln	Valves - supplied by Hamworthy		4.00 LD	20	12.00	20.00		240	\$ 400	\$ -	Pending guidance from Chart Industries
	5 2	Anchor Systems	No work.	3.00 111	valves - supplied by Harriworthy		N/A	0	-		-	-	\$ -	\$ -	industries
500 5		Barta Bartilla III and I Otana	Named				N1/A						•	•	
583 5 585 5		Boats, Boat Handling and Storage Life Rafts	No work.				N/A N/A	0	-	-	-	-	\$ - \$ -	\$ - \$ -	
586 5	5	Lift Machinery	No work.				N/A	0	-	-	-	-	\$ -	<u> </u>	
590 5 593 5			No work.				N/A N/A	0	-	-	-	-	\$ - \$ -	7	
		MSD Plant	No work.				N/A N/A	0	-		-	-	7	7	
602 6	2	Hull Designations and Markings	No work.				N/A	0	-	-	-	-	\$ -	\$ -	
		Hull Markings Locks, Keys, and Tags	Add for LNG storage and bunker stations. No work.	See I-624			Lot NSP	0	100.00	5,000.00	-	100	\$ 5,000 \$ -		1
			No work.	OCC 1-024			N/A	0	-		-	-	\$ -	Ψ	
040			Remove & replace handrails on Nav / Bridge Deck					202		22.25		272	Ф	•	
612 6 613 6		Handrails, Lifelines and Bulwarks Rigging and Lines	iwo LNG Tank installation. Provide tensioning lines for vent mast.				LF Lot	200	1.75 60.00		-	350 60	\$ 4,400 \$ 1.000	\$ - \$ -	
			Allow for removal / replacement iwo deckhouse							,			, , , , , , , , , , , , , , , , , , , ,	•	
621 6	8	Joiner Bulkheads	structural modifications.	Heads on Passenger Deck	Ripout and replace with new in kind.		LF	200	0.50	65.00		100	\$ 13,000	\$ -	<u> </u>
621 6	. 8	Joiner Bulkheads	Allow for removal / replacement iwo deckhouse structural modifications.	Office on Passenger Deck	Ripout and replace with new in kind.		LF	37	0.50	65.00		19	\$ 2,405	\$ -	
			Allow for removal / replacement iwo deckhouse	Gas Line Duct Areas iwo structural										*	
621 6	8	Joiner Bulkheads	structural modifications.	reinforcement Modify grating iwo modified area due to new	Ripout and replace with new in kind.		Sq Ft	1,680	0.1250	12.00		210	\$ 20,160	\$ -	
622 6	, 2	Floorplates and Gratings	Allowance for revised machinery arrangement.	engine. Allow 350 Sq Ft per ER.	V		Sq Ft	700	1.75	35.00		1,225	\$ 24,500	\$ -	
		Ladders and Stairways	Allowance for revised machinery arrangement.				LF	30	4.00			120		\$ -	
			Allowance for revised machinery arrangement, bridge doors, and heat exchanger / pump room												/
624 6	5 2	Doors and Hatches	house.	ER#1 (6), Pump Rm (2), & Bridge (4).			Ea	12	24.00	3,000.00		288	\$ 36,000	\$ -	/
225	_	15 15 15 15	Remove one (1) as means to accomplish material						04.00				A 0.000	•	
625 6	5 5	Windows and Portlights	flow Allow for removal / replacement iwo deckhouse				Lot	1	24.00	2,000.00		24	\$ 2,000	\$ -	
626 6	8	Joiner Ceilings	structural modifications.	Heads, seating area, and office	Ripout and replace with new in kind.		Sq Ft	1,200	0.25	2.50		300	\$ 3,000	\$ -	
624		Confess Brancostics & Continu	Allow for clean & paint of new and disturbed surfaces.	Area based on strucural mods with an			C= F4	22.007	0.090	4.20		2.040	\$ 44.183	•	
631 6 632 6		Surface Preparation & Coating Anodes	Add in wet exhaust.	assumed average 3/8" plate thickness.			Sq Ft Ea	33,987 4	6.00			3,048 24	,	\$ -	
633 6		Cathodic Protection	No work.				N/A	0	-	-	-	-	\$ -		
634 6		Deck Covering	Allow for repair of damaged areas during modifications.	Heads & passenger seating on Passenger Deck	Assume 50% damaged.		Sq Ft	600			17.50		\$ -	\$ 10,500.00	/
034 0	0	Deck Covering	Allow for repair of damaged areas during	Deck	Assume 50 % damaged.		Syrt	000	-	-	17.50	-	\$ -	φ 10,500.00	<u> </u>
634 6	8	Deck Covering	modifications.	Office on Passenger Deck	Assume 100% damaged.		Sq Ft	100	-	-	17.50	-	\$ -	\$ 1,750.00	
			Allow for removal / replacement iwo deckhouse structural modifications & main deck access cuts,												
			addition of A-60 in overhead of passenger deck in												
635 6	8	Insulation	entirety, and A-60 in gas line ducts.	Heads, seating area, and office	Ripout existing and replace with A-60.		Sq Ft	12,750	0.175	2.00	-	2,231	\$ 25,500	\$ -	4
			Allow for removal / replacement iwo deckhouse structural modifications & main deck access cuts,												A
			addition of A-60 in overhead of passenger deck in	Gas Line Duct Areas iwo structural											A
635 6	8	Insulation Sheet Metal Sheathings and	entirety, and A-60 in gas line ducts. Allow for removal / replacement iwo ER #1 & #2	reinforcement	Ripout existing and replace with A-60.	1	Sq Ft	1,680	0.175	2.00	-	294	\$ 3,360	\$ -	<u> </u>
637 6	8 8	Linings	structural modifications.	ER Overheads	Ripout & replace		Sq Ft	800	_	_	9.00	-	\$ -	\$ 7,200.00	A
638 6			No work.				N/A	0	-	-	-	-	\$ -		
641 6	, ,	Furniture	Allow for removal / replacement iwo deckhouse structural modifications.	Passenger Seating Areas	Remove, retain, and replace.		Chairs	30	8.00	_		240	\$ -	\$ -	
			Allow for removal / replacement iwo deckhouse			1								Ψ	
641 6	8	Furniture	structural modifications.	Heads	Remove, retain, and replace.		Pcs	45	6.00	30.00		270	\$ 1,350	\$ -	4
641 6	, 8	Furniture	Allow for removal / replacement iwo deckhouse structural modifications.	Office on Passenger Deck	Remove, retain, and replace.		Lot	1	24.00	200.00	_	24	\$ 200	\$ -	
			Remove and replace sanitary fixtures iwo each head	<u> </u>					200						
645 6 651 6		Plumbing Fixtures Galley Space and Equipment	under LNG storage tank installation. No work.	Included in I-641.			NSP N/A	0	-	-	-	-	\$ - \$ -	\$ - \$ -	<u> </u>
001 6	, 8	Engineers Control Room	INO WOIK.			1	IN/A	, U	-	-	-	-	Ψ -	ψ -	<u> </u>
662 6	8	Furnishings	Extend console for additional MAMS.	Included in I-436.			NSP	0	-	-	-	-	\$ -	\$ -	
663 6	. 8	Wheelhouse and Chartroom Furnishings	No work.									_	\$	\$ -	Α '
665 6	8	Shop Equipment	No work.									-	\$ -	Ψ	
671 6	8	Lockers and Special Stowage	No work.									-	\$ -		
672 6 802 8		Storerooms Contract Drawings	No work. Duration / manning based estimate.				Lot	1	-	_	750,000.00	-	Ţ	•	
552 5	- 10						201	<u> </u>			. 55,000.00		•	100,000.00	Assume 1) crafts will order material
			Owner provide Contract Drawings and DNV												from dwg BOM and 2) WSF will coordinate design issues with USCG.
			Documentation. Allow cost to expand Design for												Balance of hours are for Vigor / WSF
802 8	10	Contract Drawings	turnover to Production Engineeirng.	Material ordering, class coordination, etc			Months	2	172.00	-	-	344	\$ -	\$ -	interface.

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WSF - ISSAQUAH LNG FUEL CONVERSION REV D (2) Final.xls

Title	\M/SE - 1SS	AQUAH LNG FUEL CONVERSION ROI	MESTIMATE	T		<u> </u>		1			1				
Title	W 3F - 133		LSTON MEETING NOTES FROM 10NOV11 WSF		<u> </u>										
Owner:	WSF	MTG. DN COMMENTS ARE ADD		REV D- ADDS SUBK ENG. DNV. AND TRA	JINING BACK TO EST										
Date:	11-Nov-11	INTO: DIV COMMENTO AIRE ADD	DED IIV OCIVINIEIVI O OCEOIVIIV.	REV D' ADDO COBR ENC, DIVV, AND THE	DAGICTO EGT:										
Spec	SWBS														
Item	GROUP	Craft SWBS Title	Brief Scope	Notes 1	Notes 2	Notes 3	Unit	Qty	Unit Labor	U. Material	U. Subcontract	Total Labor	Total Material	Total Subcontract	Comments
															Assume 1) Craft will plan their own
															work. 2) Remaining hours are for
															update of master schedule by planning
813	8	0 Planning and Production Control	Duration / manning based estimate.	Planning / Scheduling			Months	6	43.00	-		258	\$ -	\$ -	department.
															Assume 1) Craft will develop their own
															production sketches, etc. 2)
															Intereferences will be dealt with
		Prod Engineering / Construction													through field coordination by supervision. 3) Remaining hours are
831	8	10 Drawings	Duration / manning based estimate.				Months	2	258.00	_	_	516	\$ -	¢ _	for structural packages, ie lofting.
001	-	Engineering Calculations / Naval					WOTHIS		230.00			310	Ψ	Ψ	ioi structurai packages, ie ioiting.
835	8	10 Architecture	Duration / manning based estimate.	Lift & turn, docking, inclining, etc			Months	1	172.00	-	-	172	\$ -	\$ -	No change
837	8	0 Photographs	Duration / manning based estimate.	,			Months	6	4.00	100.00		24	\$ 600		3
															Assume 1) craft will handle field
															engineering. 2) Remaing hours are for
838	8	10 Design/Engineering Liaison	Duration / manning based estimate.	Field Engineer			Months	6	86.00	-	-	516	\$ -	\$ -	production / engineering coordination.
840	8	0 Quality Assurance		Oversight			Months	6	40.00			240	\$ -	\$ -	
															Assume 1) craft will accomplish their
840	8	0 Quality Assurance	Quality Assurance / Accuracy Control	Quality Control / Accuracy Control			Months	6	51.60			310	¢	¢	own AC/QC work. 2) Remaining hours are for QC audit of crafts.
840	- v	7 Inclining Experiment	Accomplish inclining.	Quality Control / Accuracy Control			Lot	1	80.00	5,000.00	6,500.00	80	\$ 5,000	\$ 6.500.00	are for QC addit of Clarks.
043	U	Certification Standards - DNV	Accomplish molling.				LUI	 	80.00	3,000.00	0,500.00	60	ψ 5,000	ψ 0,500.00	
845	8	0 Fees	Weld Procedures & Weld Certification	Develop new weld procedures - None			NSP	0		_		-	\$ -	\$ -	
5-10		Certification Standards - DNV	The state of the s	= 170.0p non none procedured front			1						T	Ŧ	
845	8	0 Fees	Weld Procedures & Weld Certification	NDT / Xray			Shots	15	2.00	-		30	\$ -	\$ -	
		Certification Standards - DNV													
845	8	0 Fees	Duration / manning based estimate.									-	\$ -	\$ -	
		Certification Standards - DNV													
845	8	10 Fees	DNV				Lot	1	-	-	300,000.00	-	\$ -	\$ 300,000.00	
854	8	0 Transportation	Duration / manning based estimate.				Months	6	172.00	-		1,032	\$ -	\$ -	Reduce by 2 men / month.
	_	Technical Manuals and Other													
856	8	0 Data	Vendor pass-through.	Catalog & coordinate			Months	0.5	172.00			86	\$ -		WSF accompishes major effort.
857	8	0 Facilities 0 Personnel and Training	No upgrades expected. Allow for video training of LNG systems.	Security			Months	0	-	-	35,000.00	-	\$ -	<u> </u>	Assume to be an overhead function.
858	8	0 Training Equipment	No work.				Lot		-	-	35,000.00	-	\$ - \$ -		
859 891	8	0 Safety	Duration / manning based estimate.	Safety			Months	6	80.00			480	\$ -	<u> </u>	
897	8	0 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Project Manager			Months	8	172.00			1,376	\$ -	Ψ	
897	8	Project Management Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Paint		Hrs	10%	3,915.59	-	-	392	\$ -	\$ -	
897	8	2 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Steel		Hrs	10%	29,896.54	-	-	2,990	\$ -	\$ -	
897	8	4 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Pipe		Hrs	10%	32,685.91	-	-	3,269	\$ -	\$ -	
897	8	5 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	OSM		Hrs	10%	5,312.94	-	-	531	\$ -	\$ -	
897	8	6 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Elec		Hrs	10%	11,390.99	-	-	1,139	\$ -	\$ -	
897	8	7 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Rigging		Hrs	10%	5,720.00	-		572	\$ -	*	
897	8	8 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	Carpenter / Scaffold / Joiner		Hrs	10%	8,185.71	-	-	819	\$ -	•	
897	8	9 Project Management	Work Mgmt, Fire Guard, Supv, Watch	Front Line Supervision	HVAC		Hrs	10%	2,135.00	-	-	214	\$ -	*	
897	8	0 Project Management	Production Support	Clerical			Months	6	80.00	-		480	\$ -	T	
897 981	9	0 Project Management 0 Insurance	Production Support Taxes, Insurance, and Warranty.	Yard Superintendent			Months NSP	6	80.00		_	480	\$ - \$ -	<u> </u>	
981	9	0 Insurance	Noted - no warranty cost included.				NSP	0	-		-	-		*	
982	9	5 Trials	Dock Trials				Days	4.00	80.00	1,000.00	-	320			
982	9	0 Trials	Sea Trials - Fueling	??????			Gallons	0.00	-	-	_	-	\$ -	•	
982		0 Trials	Sea Trials - Tugs				Lot	1.00	-	-	5,000.00	-	\$ -	•	
982	9	0 Trials	Sea Trials - Pilot				Lot	1.00	-	-		-	\$ -		
982	9	0 Trials	Sea Trials - Crew	WSF Provide.			Days	0.00	-	-	-	-	\$ -	\$ -	
982	9	0 Trials	Sea Trials - Catering				Lot	1.00	-	-	1,500.00	-	\$ -	\$ 1,500.00	
982		5 Trials	Sea Trials - Production & Supervision				Days	2.00	72.00	-	-	144	\$ -	*	
983	9	1 Delivery	Clean and wash down vessel				Lot	1	-	-	5,000.00	- 1100	\$ -	¥ 0,000.00	
985	9	0 Fire and Flooding Protection	Schedule based estimate.	Firewatch	Alatanta basa da		Months	6	688.00			4,128	\$ -	-	
986	9	2 Tests and Inspection	Percentage by craft.	Steel	Air tests, hose test, and hydros.		Hours	1.0%	29,896.54			299	\$ -	•	
986	9	4 Tests and Inspection	Percentage by craft.	Pipe Pipe flush of modified systems, ie LO, FO,			Hours	7.5%	32,685.91			2,451	\$ -	<u>-</u>	
986	9	4 Tests and Inspection	Percentage by craft.	etc & purge of Nitrogen.			Days	30	60.00	750.00	_	1,800	\$ 22,500	\$ -	
986	- v	5 Tests and Inspection	Percentage by craft. Percentage by craft.	Machinist		+	Hours	5.0%	5,312.94	750.00		266	\$ 22,500	Ψ .	
986	9	6 Tests and Inspection	Percentage by craft.	Electrical			Hours	4.0%	11,390.99	-	-	456	\$ -	•	
986	9	9 Tests and Inspection	Percentage by craft.	HVAC			Hours	10.0%	2,135.00	-		214		•	
990		7 Rigging & Transportation	Provisional Lifting & Transport Equipment	Rigging & Crane			Months	6	688.00	-		4,128		*	
							_					, -			
991	9	8 Staging, Scaffolding, and Cribbing	Schedule based estimate.				Months	6	430.00	-	2,000.00	2,580	\$ -	\$ 12,000.00	
992	9	0 Temporary Utilities and Services					Hours	111950	-	0.75	-	-	\$ 83,963	\$ -	
993	9	Material Handling and Removal		Warehouse			Months	7	172.00	-		1,204	\$ -	*	Reduce by 1 man / month.
993	9	Material Handling and Removal	Production Support	Toolroom			Months	6	172.00	-	-	1,032	\$ -	\$ -	Assume another will assume the state of the
								1							Assume crafts will accomplish their
994	9	1 Cleaning Services	Clearing & Cleaning				Week	1	120.00		_	120	\$ -	¢	own cleaning. Remaining hours are for cleaning of dock.
994	Ŭ	2 Consumables	Tools, Jigs	Dogs, clips, etc		+	Lot	1	120.00	20,000.00		- 120	Ψ	Ψ	orearing or dock.
995		0 Consumables	Consumables	Dogo, onpo, oro			Hours	111,950		3.00		-			
300	-	50.104.1140100	Include based on duration required for wet exhaus:	t			. 10013	, , 550		0.00			- 555,051	•	
997	9	7 Drydocking	install.	Haul Day			Lot	1	240.00	5,000.00	5,000.00	240	\$ 5,000	\$ 5,000.00	
997	9	7 Drydocking	Keel Blocks, Pillars, Cushions	Keel Blocks			LF	350	2.00	-	-	700	\$ -	\$ -	
997	9	0 Drydocking	Lay days	Dock rental at \$0.35 per GT / Day			Days	30	-	866.25	-	-	+ -,		
												111,950	\$ 9,658,363	\$ 1,420,200.00	
											Rate	\$ 70.00	0%	0%	

Rate \$ 70.00 0% 0% Price \$ 18,915,062.83