

### H.QRA - HSEAll Tools for Quantitative Risk Assessment

#### H.QRA Tools Kit has 04 modules:

- 1. H.QRA Plant HSEAll QRA Tool for Onshore Installations;
- 2. H.QRA Pipelines HSEAll QRA Tool for Onshore Pipelines;
- 3. H.QRA Platform HSEAll QRA Tool for Offshore Platforms;
- 4. H.QRA Subsea Pipelines HSEAll QRA Tool for Subsea Pipelines.

# H.QRA - Module for Offshore Platform QRA

#### HSEAll is proud to introduce HSEAll Software for Quantitative Risk Assessment for Offshore Platforms.

Generally, Quantitative Risk Assessment (QRA) is a Process of Quantifying the Likelihoods and Consequences of potential accidents, those may occur in the installation and then combine them to produce the Risk level. Risk results shall be assessed against the relevant Risk Acceptance Criteria.

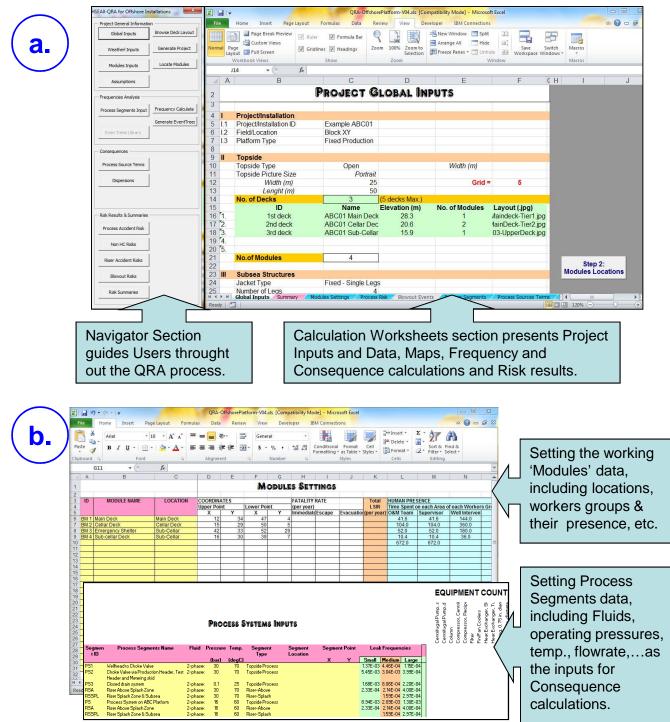
EAII-QRA for Offshore Ins				<b>PROJECT G</b>	LOBA	l înf	PUTS
Global Inputs	Browse Deck Layout						
		1	Project/Installation				
Weatherl Inputs	Generate Project	1.1	Project/Installation ID	Example ABC01			
Modules Inputs	Locate Modules	1.2 1 3	Field/Location	Block XY Eixed Production			
Assumptions	Welcome	e to	HSEAII QRA Software for Of	fshore Platform	X		
Frequencies Analysis	110	5	All				Width (m)
Process Segments Input	Frequency	) ł	AM				Gri
Even Trees Library	Generate Soft	NAR:	are for QRA of Of	fehare Diatfa	ime:	Max.)	
Consequences	a a a a a a a a a a a a a a a a a a a	el kinite	ais ini Aimi ai ai	ICHINALIC: IL ICHINAL		(m) .3	No. of Modules 1
Process Source Terms					Ales	.6 .9	2
Dispersions						.5	
Risk Results & Summaries							
Process Accident Risk	Gat	er Pal	ssword: ок	Cancel	1000	0	
Non HC Risks		-	Number of Risers	2			
Riser Accident Risks	1		Subsea Pipeline	2			
Riser Acudent Risks			Splash Zone Height (m)	4			
Blowout Risks			Water Depth (m)	42.5			
Risk Summaries		IV	Operations of Interest				
			Blowout Accident Risk	Yes			

#### **HSEAll QRA Tool:**

- Users Friendly Interface;
- Specilizing in QRA for Offshore platforms operations;
- Consistent inputs hence saving time for data collection;
- Compresive and visual Risk Assessment results;
- Easy-to-used Excel-based Software;
- Complete QRA for an offshore platform within 5-10 days.



#### **1. Interfaces of H.QRA - Module Offshore Platform**





#### 2. Input the Platform general information:

EAII-QRA for Offshore Ins		7		Project G	lobal Ini	PUTS	
Global Inputs	Browse Deck Layout	⊪—					
Global Inputs	bronde beek Euroot		Desite of the state of the state				
Weatherl Inputs	Generate Project		Project/Installation	Energie (BOOM			
		1.1	Project/Installation ID	Example ABC01			
Modules Inputs	Locate Modules	1.2	Field/Location	Block XY			
		1.3	Platform Type	Fixed Production			
Assumptions							
		Ш	Topside				
Frequencies Analysis			Topside Type	Open		Width (m)	
Process Segments Input	Frequency Calculate		Topside Picture Size	Portrait			
	Generate EventTree:		Width (m)	25		Grid =	5
1			Lenght (m)	50			
Even Trees Library			No. of Decks	3	(5 decks Max.)		
			ID	Name	Elevation (m)	No. of Modules	Layout (.jpg)
Consequences		1.	1st deck	ABC01 Main Deck	28.3	1	laindeck-Tier1.jp
Process Source Terms		2.	2nd deck	ABC01 Cellar Dec	20.6	2	ainDeck-Tier2.jp
		3.	3rd deck	ABC01 Sub-Cella	ı 15.9	1	)3-UpperDeck.jp
Dispersions		4.					
		5.					
			No.of Modules	4			
Risk Results & Summaries		l III	Subsea Structures				
Process Accident Risk			Jacket Type	Fixed - Single Leg	e		
Process Accidencesk			Number of Legs	A A	5		
Non HC Risks			Number of Risers	2			
			Subsea Pipeline	2			
Riser Accident Risks			Splash Zone Height (m)	4			
			Water Depth (m)	42.5			
Blowout Risks			Water Deptil (III)	42.0			
Risk Summaries		IV	Operations of Interest				
			Blowout Accident Risk	Yes			

#### **3. Input the Platform Operation and Escape/Evacuation Information:**

ISEAII-ORA for Offshore Ins	tallations						
		IV	Operations of Interest				
Project General Information			Blowout Accident Risk	Yes			
Global Inputs	Browse Deck Layout		Process Event Risk	Yes			
200	Generate Project		Riser Accident Risk	Yes			
Weatherl Inputs	Generate Project		Subsea Pipelines Risk	Yes			
Modules Inputs	Locate Modules		Helicopter Accident Risk	Yes			
			Boat Transfer Risk	Yes			
Assumptions			Occupational Risk	Yes			
			Ship Collision Risk	Yes			
Frequencies Analysis	1		Dropped Object	Yes			
Process Segments Input	Frequency Calculate		Structure Risk	Yes			
Process Segments Input		IV	Manning Distibution Param				
	Generate EventTree:		People On Board (POB)	15	OK		
Even Trees Library			Worker Groups	No of Personnel	%Time Offshore/yr	No. of Visit/yr	
			Production Crew	3	46%	78	
Consequences			Maintenance Crew	3	46%	12	
Process Source Terms			Well Intervention Crew	9	46%	59	
			Others	0			
Dispersions			Process Area Patrol	No. of people	Duration (min.)	Every (min.)	
			Daytime				
			Nighttime				
			Maximum POB (in any case F	OB cannot more th	nan: )	9	
Risk Results & Summaries							
Process Accident Risk		V	Escape & Evacuation				
			Temporary Muster Point				
Non HC Risks			E-House				
		I	Main Deck				
Riser Accident Risks							
Blowout Risks			Evacuation	Capacity	Status	Utility Rate	
BIOWOUT KISKS			Life Boat			0%	
Risk Summaries			Stand-by Vessel			40%	
		-	Liferaft			40%	
			Direct Evacuation to the Sea			20%	

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#### 4. Assumptions Settings:

I I	Frequencies Analysis Assump	tions				
.1	Select Database					
	Leak Hole Size (mm)	Small	Medium	Large	Rupture	
		<20mm	20 <d<80mm< td=""><td>&gt;80mm</td><td>Full bore</td><td></td></d<80mm<>	>80mm	Full bore	
	Leak Size Distributions (%)	70.00%	15.00%	15.00%	0.00%	100.00%
.2	Immediate Ignition Probabilities					
	Immediate Ignition - Gas Releases	5.00%	10.00%	15.00%	30.00%	
	Immediate Ignition - Oil Releases	1.00%	2.00%	5.00%	5.00%	
	Immediate Ignition - 2-phased	2.00%	4.00%	10.00%	10.00%	
.3	Release Detection Probabilities					
	Gas Release Detection	10.00%	20.00%	30.00%	30.00%	
	Oil Release Detection	5.00%	10.00%	10.00%	10.00%	
	2-phased Release Detection	10.00%	15.00%	20.00%	20.00%	
.4	Late Ignition Probabilities					
	Late Ignition - Gas Releases	5.00%	10.00%	15.00%	30.00%	
	Late Ignition - Oil Releases	1.00%	2.00%	5.00%	5.00%	
	Late Ignition - 2-phased	2.00%	4.00%	10.00%	10.00%	
.5	Fire Detection Probabilities	1.00%	1.00%	1.00%	1.00%	
.6	ESD Successful	1.00%	1.00%	1.00%	1.00%	
11	Consequences Analysis Assur	mptions				
1.1	Interested Radiation Level (KW/m2	37.5	20	4		
	Fatality Probability (%)	87.00%	16.00%	0.50%	Use Probit ?	Yes
1.2	Interested Overpressure Level (ps	5	1	0.1		
	Fatality Probability (%)				Use Probit ?	No
	Input Fatality Probability here =>				%	
1.3	Interested Windspeed (m/sec)	2		10		
	Stability Class / Pasquil	F		C		
	Downwind Factors	la he so anh i	huong lech Vu	ng Anh huon	g theo chieu gi	0.
	Wind Speed	37.5	20	4		
	Fire Radiation Zone	0.1	0.2	0.3		
	Explosion Overpressure	0.1	0.1	0.1		

🕨 🔏 Process Event Trees 🗶 Risers Events 🗶 Blowout Events 🧳

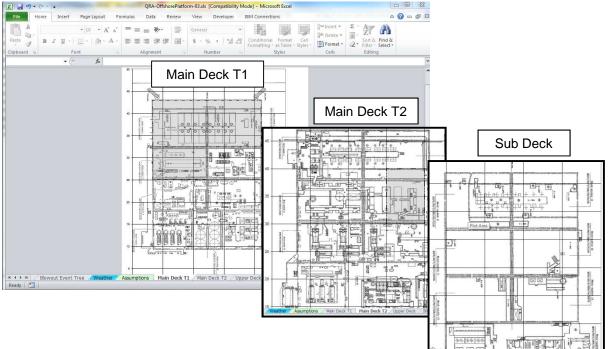
#### **5. Platform Modules Settings and Operations Factors:**

				M	ODULE	s Set	fings						
ID	MODULE NAME	LOCATION	NATES			FATALIT	Y RATE		Total	PRESENCE			
			int	Lower Po		(per year)			LSIR	Time Spent	on each Area	of each Vork	
			Y	x	Y	Immediat	Escape				Maintenance		Others
	Main Deck	Main Deck	4	40	26					1.00	2.00	6.00	
	Mezz Deck	Mezz Deck	9							1.00	2.00		
BM 3	CellarDeck-Process	Cellar Deck	3.8				4.56E-04	6.55E-06		0.50	1.00		
BM 4	CellarDeck-Utility	Cellar Deck	2.5	53			1.42E-04	1.98E-06	4.05E-04	0.50	1.00	2.00	
BM5	SubCellar	Sub-cellar Dec	4.5	36	24	6.67E-04	3.45E-04	5.00E-06	1.02E-03	1.00	2.00		
													-
-													
		-	-										
		-											
		_											
<u> </u>		-											
										Total Hours	per Day/Trip		
										4.00	8.00	8.00	

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### 6. Visualizing Platform Layout, Floors/Decks and Modules:

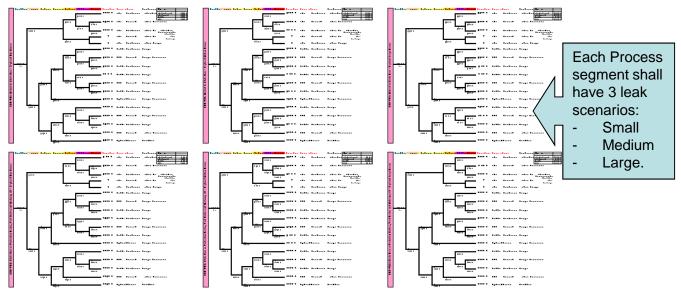


#### 7. Setting Process Segments those may cause HC leak incidents/accidents:

										EQU	JIPME	INT	col	ЈИТ
			Proc	:ESS \$	ystems Ini	PUTS				Centrifugal Pump, s Centrifugal Pump, d	Column Compressor, Centril Compressor, Becipi	Filter FiniFan Coolers	Heat Exchanger, Sł Heat Exchanger, Tu	Piping, 0. 75 in. dian
Segmen t ID	Process Segments Name	Fluid	Pressure	Temp.	Segment Type	Segment Location	Segment P	oint	Leak Frequencies					
(ID			(bar)	(degC)	Type	Location	×	Y [	Small Medium Large					
PS1 PS2	Wellhead to Choke Valve Choke Valve via Production Header, Test Header and Metering skid	2-phase 2-phase	30 30	70 70	Topside Process Topside Process				1.37E-03 4.46E-04 1.15E-04 5.45E-03 3.04E-03 3.99E-04					
PS3	Closed drain system	2-phased		25	Topside Process				1.68E-03 8.06E-04 2.20E-04					
RSA	Riser Above Splash Zone	2-phase		70	Riser-Above				2.33E-04 2.14E-04 4.00E-04					
RSSPL PS	Riser Splash Zone & Subsea Process System on ABC Platform	2-phase 2-phase		70 60	Riser-Splash Topside Process				1.59E-04 2.97E-04 8.94E-03 2.09E-03 1.30E-03					
RSA	Riser Above Splash Zone	2-phase( 2-phase)		60	Riser-Above				2.33E-04 2.14E-04 4.00E-04					
RSSPL	Riser Splash Zone & Subsea	2-phased		60	Riser-Splash				1.59E-04 2.97E-04					
		]			<b>_</b>			~		<u> </u>				
Ir	ne Process system	i sha	ll be (	devi	ded into :	separate	)     Le	eak	frequecies of	each				
Pr	Process Segments, having number of process							roc	ess Segment	shall				
ec	quipment such as pressure vessels, pumps								alculated using	3				
pi	oings, flanges, filte	ers, p	umps	s, et	tc. potent	ially		•	ipment Count					
ca	use leaks of haza	rdous	s sub	tanc	ces.		m	eth	nodology.					



8. Generating Event Trees for each Process Segments accidental scenarios:



The generic leak frequencies and probabilities shall be automatically assigned to relevant Event Trees, to produce frequencies of Accidental Scenario Outcomes.

#### 9. Analyzing the Risk of Non-Hydrocarbon incidents/accidents:

roject General Information	n	F	ile	Home Insert Page Lay	out Formulas	Data I	Review	View	Developer II	BM Connectio	ons		
Global Inputs	Browse Deck Layout	ľ	3	Arial - 10	$A_{A'} = ;$	= 😑 🗞 -		General	•				B <sup>r</sup> ⇔Insert ≁ B* Delete ≁
Weatherl Inputs	Generate Project	Pa	cte.	🚽 B I U - 🔛 - 🔮	•• <u>A</u> • ≡ :	Alignment		\$ ~ %		Conditional Formatting *		Cell Styles +	Format Cells
Modules Inputs	Locate Modules	Clip	poard			Augnment	- 0	Nun	iber is		Styles		Cens
			_	130 <del>•</del> (* <i>f</i>									
Assumptions		1	A	B	C	D		E	F	GH	_	1	
requencies Analysis		2		Non Hy	ROCARBO	on Risk	ANA	LYSES					
	Harrison and the second	4	L.	Transportation Risk									
rocess Segments Input	Frequency Calculate	5	1.1	Crew Boat Transfer	CMPT	Fatality Rate	/hr) IR (	/return trip)					
	farming and the	6		Transit Time per Return Trip (hr	0.67	0.00E		0.00E+00					
	Generate EventTree:	7		Transfer Stage per Return Trip	2	2.60E	-07	5.20E-07					
Even Trees Library		8		Stop-over during Trip	0								
Even nees borary		9 10		Total				5.20E-07	(per return trip	)			
			1.2	Helicopter Accident Risk	CMPT								
onsequences		12	1.	In-flight Accident	0.00E+00								
1	1	13		In-flight Accident Frequency	0.00E+00								
Process Source Terms		14		Return Flight Time (hour)	1.5	Note: 45' per	trip x 2 r	eturn trips = §	90' return trip				
		15		Probability of Fatal Accident	0								
Dispersions		16		Prob. of Death in Fatal Acc.	0.79								
bioperoiono	1	17	2.	Take-off & Landing	1.02E-07								
		18		Take-Off Accident Frequency	7.20E-07								
		19		Landing Accident Frequency	1.90E-06								
		20		Probability of Fatal Accident	0.13								
		21		Prob. of Death in Fatal Acc.	0.3								
sk Results & Summaries -	1	22											
2 2 1		23	1.3	<b>Transportation Risks Summary</b>									
Process Accident Risk		24		Crew Boat Transfer	No. of Trip/yr	% Time Offst		IRPA	PLL (per year)				
		25		O&M Team	26		0%	6.76E-06	5.41E-05				
Non HC Risks		26		Supervisor	12		0%	3.12E-06	6.24E-06				
HUTTING KISKS		27		Well Intervention	15		8%	6.50E-07	7.02E-05				
a a 1	1	28		0	0		0%	0.00E+00	0.00E+00				
Riser Accident Risks		29							1.31E-04				
		30		Helicopter Transport Risk	No. of Trip/yr	% Time Offst		IRPA	PLL (per year)				
Blowout Risks		31		O&M Team	13		0%	1.33E-06	5.31E-06				
DIOVIOUC RISKS		32		Supervisor	13	5	0%	1.33E-06	1.33E-06				
1		33		Well Intervention	1		8%	1.02E-07	9.20E-07				
Risk Summaries		14 4	())	Process Sources Terms	Process Conseq	uences Pro	cess Ev	ent Trees	Risers Events	Non HC	Risk 🖉 We	ather /	Assumpti

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#### **10. Risk Calculation Results:**

	Personnel	RISK ANA					III. Summary					
							III.1 Potential Loss of Li					
							Categories	PLL (per year)	Contributions (%	)		
	Hydrocarbon Risk						Blowout Accident	1.44E-05				
	Potential Loss of Life (F		Escape	Evacuation	Total		Process Accident	2.28E-04	15.1%			
	Blowout Accident	1.17E-05	2.33E-06	3.50E-07	1.44E-05	5.76%	Riser Accident	6.64E-06	0.4%			
	Process Accident	1.44E-04	8.28E-05	1.03E-06	2.28E-04	91.42%	Subsea Pipelines	4.00E-07	0.0%			
	Riser Accident	4.30E-06	2.29E-06	4.36E-08	6.64E-06	2.66%	Transportation	8.06E-04	53.5%			
	Subsea Pipelines	2.34E-07	8.30E-08	8.30E-08	4.00E-07	0.16%	Occupational	2.90E-04	19.2%			
					2.49E-04		Ship Collision	1.60E-04	10.6%			
1.2	Location Specific Individ	dual Risk (LSIR)					Dropped Object	3.00E-07	0.0%			
							Structure Failure	3.23E-07	0.0%			
	Main Deck				8.41E-04		Total	1.51E-03				
	Mezz Deck				1.35E-03							1
	CellarDeck-Process				1.35E-03		1					
	CellarDeck-Utility				4.05E-04		1					
	SubCellar				1.02E-03		1					
							1			-Structure	Epilure	
					4.96E-03		1	Dropped Object	t−∖	Jourdenare	i anuro	
				Vell Interventio						-Blowout	Accident	
	Blowout Accident Risk	1.40E-06	4.32E-07	1.59E-06	0.00E+00			hin Collision-	$\langle \rangle \rangle$	Blowout	Accident	
	Blowout Accident Risk Process Event Risk	1.40E-06 1.67E-05	4.32E-07 5.15E-06	1.59E-06 1.81E-05	0.00E+00 0.00E+00		s s	hip Collision		/		ł
	Blowout Accident Risk Process Event Risk Riser Accident Risk	1.40E-06 1.67E-05 2.21E-06	4.32E-07 5.15E-06 2.21E-06	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00				$\square$	/	ss Acciden	
	Blowout Accident Risk Process Event Risk	1.40E-06 1.67E-05	4.32E-07 5.15E-06	1.59E-06 1.81E-05	0.00E+00 0.00E+00		S Occupational			/	ss Acciden	t r Accident
	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk	1.40E-06 1.67E-05 2.21E-06	4.32E-07 5.15E-06 2.21E-06	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden	
	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk	1.40E-06 1.67E-05 2.21E-06 1.33E-07	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser	Accident
II. II.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk <b>Non Hydrocarbon Risk</b> Potential Loss of Life (F	1.40E-06 1.67E-05 2.21E-06 1.33E-07	4.32E-07 5.15E-06 2.21E-06	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser	Accident
II. II.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk	1.40E-06 1.67E-05 2.21E-06 1.33E-07 Contributors	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser	Accident
II. II.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk <b>Non Hydrocarbon Risk Potential Loss of Life (F</b> Transportation	1.40E-06 1.67E-05 2.21E-06 1.33E-07 Contributors 8.06E-04	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser	Accident
II. II.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation <i>Helicogeter Accident Risk</i>	140E-06 1.67E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 .2.32E-04	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser	
II. II.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation Helicopter Accident Risk Ecoal Transfer Risk	1.40E-06 1.67E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 3.38E-04 4.67E-04	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
11.	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation <i>Helicopter Accident Risk Ecal Transfer Risk</i> Occupational	140E-06 1.87E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 2.33E-04 4.67E-64 2.30E-04 2.30E-04	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					/	ss Acciden Riser Subsea	Accident
11.1	Blovout Accident Risk Process Event Risk Fiser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation Helicopter Accident Risk Scipt Collision	140E-06 167E-05 2.2/E-06 1.33E-07 Contributors 8.06E-04 3.33E-07 4.07E-04 2.30E-04 1.60E-04	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
11.1	Blowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation Helicopter Accident Risk Boar Transfer Risk Occupational Ship Collision Dropped Dbject	140E-06 167E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 <i>X</i> .738 <i>F</i> .64 <i>X</i> .758 <i>F</i> .758 <i>F</i> .758 <i>X</i> .758 <i>F</i> .7	4.32E-07 5.15E-06 2.21E-06 1.33E-07	1.59E-06 1.81E-05 7.38E-07	0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blowout Accident Fisk Process Event Fisk Fiser Accident Fisk Subzea Pipelines Fisk Non Hydrocarbon Fisk Potential Loss of Life (Transportation Helicopter Accident Fisch Docupational Ship Collision Dropped Object Structure Failure	140E-06 167E-05 2.27E-06 1.33E-07 Contributors 8.06E-04 .2.78E-04 	4.32E-07 5.15E-06 2.21E-06 1.33E-07 2	159E-06 181E-05 7.38E-07 4.45E-08	0.00E+00 0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Biowout Accident Risk Process Event Risk Riser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation <i>Helicogter Accident Risk</i> <i>Boar Transfer Risk</i> Docupational Ship Collision Droped Object Structure Failure Total	140E-06 167E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 4.738E-07 4.60E-04 1.60E-04 3.00E-07 3.23E-07 1.26E-03	4.32E-07 5.15E-06 2.21E-06 1.33E-07 2	159E-06 181E-05 7.38E-07 4.45E-08	0.00E+00 0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blowout Accident Fisk Process Event Fisk Fiser Accident Fisk Subsea Pipelines Fisk Non Hydrocarboon Risk Potential Loss of Life (F Transportation Helicoger Accident Fisk Occupational Ship Collision Dropped Object Structure Failure Total IFPA	140E-06 187E-05 2.21E-06 1.33E-07 Contributors 8.06E-04 4.07E-04 2.30E-04 1.00E-04 3.00E-04 3.00E-04 3.02E-07 1.26E-03 Production Crev I	4.32E-07 5.16E-06 2.21E-06 1.33E-07 %	159E-06 181E-05 7.39E-07 4.45E-08	0.00E+00 0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
11.1	Blowout Accident Risk Process Event Risk Process Event Risk Subsea Pipelines Risk <b>Non Hydrocarbon Risk</b> <b>Potential Looss of Life (F</b> Transportation <i>Helicopter Accident Risk</i> <i>Boat Transfer Risk</i> Docupational Ship Collision Dropped Object Structure Failure Total IRPA Transportation	140E-06 157E-05 221E-06 133E-07 Contributors 8.06E-04 .0.06E-04 .0.06E-04 2.06E-04 1.00E-04 1.00E-04 1.00E-04 2.02E-03 Production Creat 2.58E-05	4.32E-07 5.15E-06 2.21E-06 1.33E-07 × Maintenance Cr 3.97E-06	159E-06 138E-05 7.38E-07 4.45E-08 ¥ell Interventio 3.12E-05	0.00E+00 0.00E+00 0.00E+00 0.00E+00					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blovout Accident Fisk Process Event Fisk Piter Accident Fisk Subsea Pipelines Fisk Non Hydrocarbon Fisk Potential Loss of Life (F Transportation Helicoper Accident Fisk Coupational Ship Collision Dropped Object Structure Failure Total IFPA Transportation Helicoper Accident Fisk	140E-06 157E-05 2.21E-06 1.33E-07 8.00E-04 4.32%E-04 4.32%E-04 4.32%E-04 1.00E-04 1.00E-04 1.00E-07 3.23E-07 1.22E-03 Production Crea 2.55E-05 8.63%E-06	4.322-07 5.15E-06 2.21E-06 1.33E-07 × * Maintenance Cr 3.37E-06 <i>0.802E-07</i> 2.43E-06	158E-06 191E-06 7.38E-07 4.45E-08 ¥ell Interventio 0.3EE-05 1772€-06	0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 <i>ange-an</i>					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blovout Accident Risk Process Event Risk Fiser Accident Risk Subsea Pipelines Risk Non Hydrocarbon Risk Potential Loss of Life (F Transportation Helicopter Accident Risk Ship Collision Dropped Object Structure Failure Total IRPA Transportation Helicopter Accident Risk Boat Transfer Risk	140E-06 187E-05 221E-06 1.33E-07 8.06E-04 8.06E-04 4.67E-04 2.00E-04 1.00E-04 3.00E-07 2.32E-07 2.23E-07 2.25E-06 2.26E-06 2.26E-06 2.26E-06 2.26E-06	4.32E-07 5.15E-06 2.21E-06 1.33E-07 2.21E-06 1.33E-07 2.21E-06 3.37E-06 <i>AddE-dd</i> <i>3.37E-06</i> <i>AddE-dd</i> <i>3.37E-06</i>	159E-06 189E-06 7.38E-07 4.45E-08 Vell Interventio 0.12E-05 1.23E-06	0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 <i>a nae-na</i> <i>a nae-na</i>					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blovout Accident Fisk Process Event Risk Piter Accident Risk Subsea Pipelines Fisk Non Hydrocarbon Risk Potential Loss of Life (Transportation <i>Helicoper Accident Risk</i> Goupational Ship Collision Dropped Object Structure Failure Total RIPA Transportation <i>Helicoper Accident Risk</i> <i>Boat Transfer Risk</i> Ocupational Risk.	140E-06 157E-05 2.21E-06 1.33E-07 8.05E-04 8.05E-04 4.32%E-04 4.32%E-04 2.00E-04 1.00E-04 3.00E-07 2.23E-07 1.28E-05 8.62%E-06 6.57E-06	4.322-07 5.15E-06 2.21E-06 1.33E-07 × * Maintenance Cr 3.37E-06 <i>0.802E-07</i> 2.43E-06	158E-06 191E-06 7.38E-07 4.45E-08 0.3EE-06 1.72€-06 1.73€-06 1.13€-06	0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00					Proce	ss Acciden Riser Subsea	Accident
II. II.1	Blovout Accident Fisk Process Event Fisk Process Event Fisk Subsea Pipelines Fisk <b>Non Hydrocarbon Fisk</b> <b>Potential Loss of Life (F</b> Transportation <i>Helicopter Accident Fisk</i> Decupational Ship Collision Dropped Object Structure Failure <b>Total</b> <b>IRPA</b> Transportation <i>Helicopter Accident Fisk</i> Decupational Fisk Ship Collision Fisk	140E-06 187E-05 2.21E-06 1.33E-07 2.00E-04 2.00E-04 2.00E-04 2.00E-04 2.00E-07 2.258E-05 <i>0.00E-07</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 2.58E-05 <i>0.00E-04</i> 0.00E-04 0.00E-06 0.00E-04 0.00E-06 0.00E-04 0.00E-06 0.00E-04 0.00E-06 0.00	4.322-07 5.15E-06 2.24E-06 1.33E-07 2.4E-06 1.33E-07 2.43E-06 2.43E-06 1.30E-06	158E-06 181E-05 7.38E-07 4.45E-08 Vell Interventio 3.12E-05 1.73E-05 1.23E-05 1.23E-05 1.23E-05 1.23E-05	0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00 0.00E-00					Proce	ss Acciden Riser Subsea	Accident

#### 11. Visualizing Risks against the set Risk Criteria:

Risk level of each Module will be assessed against the Set Criteria and present in each Module.

IV	Colours set for LSIR Levels	Set Value	Color	
	Level 1 (Untolerable)	1.0E-03	Red	
	Level 2 (ALARP-Upper Limit)	1.0E-04	Pink	
	Level 3 (ALARP-Lower Limit)	1.0E-05	Blue	
	Level 4 (Lowest)	1.0E-06	Green	

