CROSSWIND

TECHNICAL QUERY
Hollandse Kust Noord

No. TQ :	TQ-0002	Rev:	A

Originating Party	Crosswind					
Subject	Transportation accelerations for CPI design					
Author	Stephen Bremner	TQ Aconex unique number: CWHKN-INN-BPH-TQ-00028				
Interface TQ - from		TQ interface source Aconex unique number:				
Type	Query		X	Interface		
	Deviation			Derogation (SHALL[PS])		
	Note: No deviations nor derogations which have an adverse effect on HSSE will be granted					
Workpackage						
Area(s) of application	Design & Eng.	x	Procurement		Construction	
	Commissioning		Operations		Other	
Issue date			Urgent reply 5 days		Routine reply 10 days	x
Close-out date	03-11-2023					
Closed-out by	DS		TQ status:		Closed-out	

1. Description

Reference documents / Aconex unique numbers:

Please provide design accelerations for the sea transportation to be used for the package design of the free issued items (CPI).

These will be used to update the FEED numbers with the latest barge layout and align package design with the topsides. Please ensure that these values will not become more severe at a later stage.

2. Response

Reference documents / Aconex unique numbers

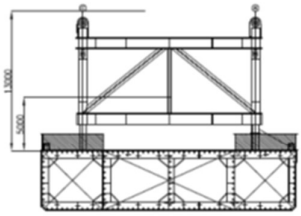
Please refer to the below Table :

LEVEL	Accelerations	
	a_H [g]	a_V [g]
Lower Deck	±0.60	±0.5
Upper Deck	±0.70	±0.5

Sea Transport Accelerations

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The above accelerations are defined based on the layout here presented and performed with ref. to DNVGL-ST-N001 for unrestricted tow.





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TRANSPORT FORCES ON CARGO

In accordance with: DNVGL ST N001 2018-amended 2020

Barge data		Cargo barge		P-81
Length	L =	84.00	m	
Breadth	B =	23.50	m	
Depth	D =	5.30	m	
Draft	d =	2.65	m	from barge keel
Cargo data				equip. at LD
Weight	W =	1.00	kN	
C.o.G.	x =	-34.00	m	from c.g. of barge
	y =	-8.00	m	from centerline
	z =	5.00	m	from barge deck
distance from roll axis	d_t =	11.07	m	on water plane
d_t angle	α_t =	-0.81	rad	from vertical
distance from pitch axis	d_l =	34.85	m	on water plane
d_l angle	α_l =	-1.35	rad	from vertical

Motion data (single amplitude, in 10 sec full cycle period)

Transportation duration: Unrestricted operations

Transportation area: Non-benign

		Roll	Pitch	Heave	
Maximum amplitude	a =	20.0	12.5		deg
Max acceleration	ä =	0.138	0.086		rad/s^2
	ä =			0.2	g

Forces, per unit weight, due to:		Roll	Pitch	Heave	Gravity
Inertia force = (W/g) d ä	F =	0.16	0.31	0.20	
Transverse components	F_t =	0.11		0.07	0.34
Vertical components	F_v =	-0.11		0.19	0.94
Longitudinal components	F_l =		0.07	0.04	0.22
Vertical components	F_v =		-0.30	0.20	0.98

Accelerations at cargo c.o.g.	Transv.	Longit.	Vertical	
1 + Roll + Heave	0.52		1.02	g
2 + Roll - Heave	0.38		0.64	g
3 - Roll + Heave	-0.52		1.24	g
4 - Roll - Heave	-0.38		0.86	g
5 + Pitch + Heave		0.33	0.87	g
6 + Pitch - Heave		0.24	0.48	g
7 - Pitch + Heave		-0.33	1.47	g
8 - Pitch - Heave		-0.24	1.08	g

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Length	L =	84.00	m	
Breadth	B =	23.50	m	
Depth	D =	5.30	m	
Draft	d =	2.65	m	from barge keel
Cargo data				equip. at UD
Weight	W =	1.00	kN	
C.o.G.	x =	-34.00	m	from c.g. of barge
	y =	-8.00	m	from centerline
	z =	13.00	m	from barge deck
distance from roll axis	d_t =	17.58	m	on water plane
d_t angle	α_t =	-0.47	rad	from vertical
distance from pitch axis	d_l =	37.43	m	on water plane
d_l angle	α_l =	-1.14	rad	from vertical

Motion data (single amplitude, in 10 sec full cycle period)

Transportation duration: Unrestricted operations

Transportation area: Non-benign

		Roll	Pitch	Heave	
Maximum amplitude	a =	20.0	12.5		deg
Max acceleration	ä =	0.138	0.086		rad/s^2
	ä =			0.2	g

Forces, per unit weight, due to:		Roll	Pitch	Heave	Gravity
Inertia force = (W/g) d ä	F =	0.25	0.33	0.20	
Transverse components	F_t =	0.22		0.07	0.34
Vertical components	F_v =	-0.11		0.19	0.94
Longitudinal components	F_l =		0.14	0.04	0.22
Vertical components	F_v =		-0.30	0.20	0.98

Accelerations at cargo c.o.g.	Transv.	Longit.	Vertical	
1 + Roll + Heave	0.63		1.02	g
2 + Roll - Heave	0.49		0.64	g
3 - Roll + Heave	-0.63		1.24	g
4 - Roll - Heave	-0.49		0.86	g
5 + Pitch + Heave		0.40	0.87	g
6 + Pitch - Heave		0.31	0.48	g
7 - Pitch + Heave		-0.40	1.47	g
8 - Pitch - Heave		-0.31	1.08	g

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