CROSSWIND

TECHNICAL QUERY
Hollandse Kust Noord

No. TQ :	CW-ROS-TQ-0016	Rev:	1

Originating Party	CrossWind					
Subject	Design of Hydrogen Supply Pressure Control Valves : 25-PV-055 A/B					
Author	Paul Kyle	TQ Aconex unique number: CWHKN-INN-BPH-TQ-00053				
Interface TQ - from	Rosetti	TQ interface source Aconex unique number:				
Type	Query			Interface		X
	Deviation			Derogation (SHALL[PS])		
	Note: No deviations nor derogations which have an adverse effect on HSSE will be granted					
Work package						
Area(s) of application	Design & Eng.	X	Procurement		Construction	
	Commissioning		Operations	X	Other	
Issue date	20-05-2024		Urgent reply 5 days	X	Routine reply 10 days	
Close-out date						
Closed-out by	CRW DC		TQ status:		Closed-out	

1. Description

Reference documents / Aconex unique numbers :

Ref.: Ballard, "Fuel Cell Package Hydrogen Usage and Fuel Cell Module Alarm Limits", Rev.001, 24/04/2024



HydrogenFlowRates rev1.pdf

Contractor kindly asks RM to consider the below data to design the H2 control system upstream of the fuel cell interface:

- Normal Hydrogen Storage Vessel Pressure (i.e. upstream pressure): 30 barg to 5 barg.
  - Extreme pressure expected, upstream of the PVs, will be High High Pressure Alarm Point.
- Normal Hydrogen supply temperature (ambient temperatures): -8.4 ºC to 25 ºC.
- Hydrogen Supply flow range: 0.9 g/s (3.24 kg/hr) to 29.4 g/s (105.84 kg/hr).
- Hydrogen supply pressure to Fuel Cell: 4 barg to 6.5 barg.
- Normal supply pressure to be controlled at 6 barg.
- PSV (80-PSV-001) set point is 10 barg.
- Transient pressure acceptable to Fuel Cell in the event of PSV lifting, is <=13.5 barg.

Other Parameter that should be considered in determining the control response are the below Hydrogen Consumption scenarios (Ref.: Ballard, "Fuel Cell Package Hydrogen Usage and Fuel Cell Module Alarm Limits", Rev.001, 24/04/2024):

This communication is issued for the recipient's information and to facilitate the obligations of the Parties under the Contract. This communication has no authority to amend or vary the Contract nor relieve either Party of any duties, obligations or responsibilities.

Scenario	Fuel Cell Modules	Description	Hydrogen Usage Initial [g/s]	Hydrogen Flowrate After [g/s]	Duration of change [s]
Startup	1	A single fuel cell module start up	0	0.9	3
Startup	3	Half (3) of the fuel cell module start up	0	2.7	3
Startup	6	All (6) of the fuel cell module start up	0	5.4	3
Ramp-up	1	Single module ramps from idle to full power	0.9	3.6	18
Ramp-up	3	Half (3) module ramps from idle to full power	2.7	10.8	18
Ramp-up	6	All (6) module ramps from idle to full power	5.4	21.6	18
Stopdown	1	A single fuel cell module performs a controlled stop	4.9 (worst) 3.9 (expected)	0	15
Stopdown	3	Half (3) fuel cell module performs a controlled stop	14.9 (worst) 10.8 (expected)	0	15
Stopdown	6	All (6) fuel cell module performs a controlled stop	29.4 (worst) 23.4 (expected)	0	15
ESD	1	A single fuel cell module performs an emergency stop	4.9 (worst) 3.6 (expected)	0	0.02 (20 ms)
ESD	6	All fuel cell modules perform an emergency stop	29.4 (worst) 23.4 (expected)	0	0.02 (20 ms)

2. Response

Reference documents / Aconex unique numbers

Rosetti acknowledges above requirements and it will proceed with this change assessing the impacts and changes.
A new control valve will be purchased and logic in split range adapted.

3. Response

Reference documents / Aconex unique numbers

This communication is issued for the recipient's information and to facilitate the obligations of the Parties under the Contract. This communication has no authority to amend or vary the Contract nor relieve either Party of any duties, obligations or responsibilities.

This communication is issued for the recipient's information and to facilitate the obligations of the Parties under the Contract. This communication has no authority to amend or vary the Contract nor relieve either Party of any duties, obligations or responsibilities.