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EXTERNAL REFERENCE / VERSION

Report

Arrangement 5 - CVNB Volume control tank(26CVNB-TA-5700) Equipment Summary

This document provides a summary of CVNB Volume control tank(26CVNB-TA-5700)

<i>Approval Process</i>			
	<i>Name</i>	<i>Action</i>	<i>Affiliation</i>
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<i>Reviewers</i>	Berruyer F. Ghirelli N. Ricou E. Van hove W.	05 Apr 2023:recommended 04 Apr 2023:recommended (Short Cycle)	IO/DG/CNST/PLD/MID/TCWS IO/DG/CNST/PLD/MID/TCWS IO/DG/CNST/PLD/MID/TCWS ORNL - Oak Ridge National Laborator...
<i>Previous Versions</i>	Ciampichetti A. Gao J.	01 Apr 2023:recommended v2.1 04 Apr 2023:recommended v2.1	IO/DG/CNST/PLD/MID/CMW IO/DG/CORP/FPD/PCD/CAL
<i>Approver</i>	Lioce D.	07 Apr 2023:approved	IO/DG/CNST/PLD/MID/TCWS
<i>Document Security: Internal Use RO: Lioce Donato</i>			
<i>Read Access</i>	LG: Arrangement 5 Cost Estimation, LG: USDA Arrangement 5, LG: Management, GG: IO DDGs (and Senior Advisors), AD: IO_Director-General, AD: External Management Advisory Board, AD: OBS - Project Control Office (PCO), AD: IDM_Controller, AD: OBS - Procurement & Contracts Division (PCD), AD: Auditors, p...		

Change Log

Arrangement 5 - CVNB Volume control tank(26CVNB-TA-5700) Equipment Summary (8U72QK)

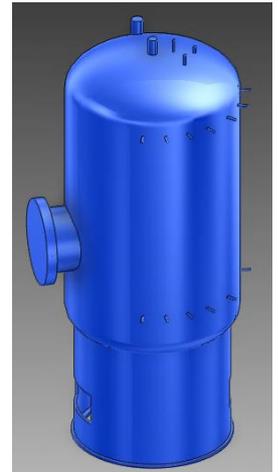
<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
v0.0	In Work	10 Mar 2023	
v1.0	Signed	13 Mar 2023	The first version for review.
v2.0	Signed	27 Mar 2023	Updated based on the reviewer's comment.
v2.1	Signed	29 Mar 2023	Updated based on the reviewer's comment. The native word file with revision track with respect to the first version is attached.
v2.2	Approved	04 Apr 2023	The type of anchoring system is revised to EPs.

OPERATIONAL NARRATIVE

CVNB Volume Control Tank (VCT) is a suction tank of CVCS (Chemistry and Volume Control System) charging pump which is associating to the primary circuit of NBI (Neutral Beam Injector) PHTS (Primary Heat Transfer System) during plasma operation.

Disclaimer:

- Contents of this document have been assembled, reviewed and approved as for Information Only,
- May not be used for purchasing, fabrication or construction,
- May not be used as verified input to any document (may be used as unverified assumption).

**PHYSICAL ATTRIBUTES**

<i>Commodity Type:</i>	Cylindrical Vessel
<i>Number of equipment:</i>	1
<i>Type:</i>	Vertical Vessel
<i>Type of Head:</i>	2:1 Ellipsoidal
<i>Inner Diameter:</i>	1.6 m
<i>Approx. Height:</i>	Cylinder: 2.2 m Overall: 4.0 m with skirt
<i>Approx. Weight:</i>	12 000 kg (wet)
<i>Tank Volume:</i>	5.5 m ³
<i>Service Fluid:</i>	Demineralized Water
<i>Material Notes:</i>	Vessel, Internals: 304L or 316L with composition requirement: cobalt <0.20 wt%, Niobium < 0.1 wt% and Tantalum < 0.05 wt%.
<i>Anchoring system</i>	Embedded plates/ Bolting
<i>Component configuration</i>	Alone
<i>Design Life Time:</i>	20 years

ENVIRONMENTAL CONDITIONS

<i>Integrated Dose Rate 20yrs:</i>	≤ 10 Gy
<i>Magnetic Field:</i>	≤ 35 mT
<i>Normal temperature</i>	5 – 35 °C
<i>Normal Humidity</i>	40 – 60 %
<i>Normal Pressure relative to atm:</i>	-0.14 kPa
<i>Accidental Temperature</i>	130 °C
<i>Accidental Pressure relative to atm:</i>	-5 to +100 kPa
<i>Accidental Humidity</i>	100 %

WBS: Chemical & Volume Control System

PBS: 26CVBD / GBS: 14-L4-21

Functional Reference: 26CVNB-TA-5700

REFERENCE DOCUMENTS

Sizing calculation: ITER_D_UDKM38_v2.0

PID: ITER_D_XJ36P5_v2.3

DESIGN CODES AND SHIPPING

<i>French Law Pressure Category / Nuclear Class:</i>	ESPN / IV / N3
<i>European Law:</i>	PED
<i>Fluid Type / Fluid group</i>	Gas / Group 2
<i>Conformity Assessment Module:</i>	IV, module G
<i>Construction Codes:</i>	ASME VIII Div2
<i>Safety Class:</i>	SIC-1
<i>Quality Class:</i>	QC-1
<i>Seismic Class:</i>	SC1 (S)
<i>Fire:</i>	Eurocode 2h
<i>Shipping Information:</i>	Conventional Exceptional Load (CEL), Oversea packing per ASME NQA-1 Level C, DAP at ITER site

CVNB – Volume Control Tank (26CVNB-TA-5700)

PARAMETERS

Parameter	Value
Nominal Temperature (°C)	38
Design Temperature (°C)	100
Nominal Pressure (MPa)	0.30
Design Pressure (MPa)	1.20
Nominal mass flowrate (kg/s)	20
Thermal insulation thickness (mm)	50

NOZZLE SCHEDULE

I.D.	DN / Schedule	Service
N1	80 / 40S	Inlet
N2	80 / 40S	Outlet
N3	50 / 40S	Pump min. flow
N4	15 / 40S	Pressure transmitter
N5	25 / 40S	Vent
N6	25 / 40S	Vent
N7	25 / 40S	Nitrogen supply
N8	15/40S	Online hydrogen monitor
N10/N11	15/40S	Level instrument
N12	-	Thermowell
N13/N14	15/40S	Level instrument
N15	600 (TBD)	Manway
N16	25/40S	Overpressure protection device
N17	100/40S	Saturated water/steam
N18	25/40S	Demineralized water
N19	15/40S	Sample return
N20/N21	15/40S	Level instrument
N22/N23	15/40S	Level instrument
N24/N25	15/40S	Level instrument

Notes:

1. Approximate footprint is based on 3d model approved configuration.
2. All nozzles are butt-welded.
3. Support/skirt shall be accounted in the vendor estimate. The approximate clearance between tank bottom and floor is 1.0 m.
4. Internal pipe shall be provided for Nozzle N1.
5. Internal pipe with sparger shall be provided for Nozzle N17.
6. Vortex breaker shall be provided for nozzle N2 in the bottom.
7. Minimum documentation shall include: Quality plans, Manufacturing & inspection plans, Procedures, Calculation note, Working instructions, Special process qualifications (if applicable), Welders and NDE personnel qualifications, Design and As-built drawings, Contractor release note, Material certification and inspection documents according to EN 10204 Type 3.1 (or equivalent) traceable to the component part and equipment.

