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EXTERNAL REFERENCE / VERSION

Design Report

Arrangement 5 - PHBD Pressure Relief Tank (26PHBD-TA-7001) Equipment Summary

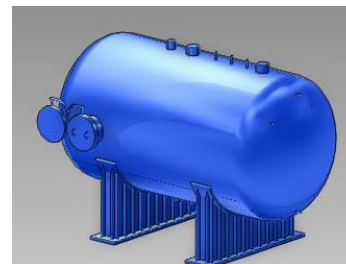
This document provides a summary of PHBD Pressure Relief Tank (26PHBD-TA-7001)

Approval Process			
	<i>Name</i>	<i>Action</i>	<i>Affiliation</i>
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Document Security: Internal Use RO: Lioce Donato			
<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...		

<i>Change Log</i>			
Arrangement 5 - PHBD Pressure Relief Tank (26PHBD-TA-7001) Equipment Summary (3LE5Y9)			
<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
v0.0	In Work	13 Mar 2023	
v1.0	Signed	13 Mar 2023	This document provides the summary of PHBD Pressure Relief Tank (26PHBD-TA-7001)
v2.0	Approved	27 Mar 2023	New version with comments of reviewer implemented

OPERATIONAL NARRATIVE

The Pressure Relief Tank is designed to condense the steam released from the PRV (Pressure Relief Tank) and maintain it in a subcooled state during normal operating conditions. In addition it should condense and cool the excessive discharge coolant during the accident for LOSP (Loss of Site Power) for 32 hours.

**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>	TANK
<i>Type:</i>	Horizontal Vessel
<i>Approx. Footprint:</i>	6.6 m x 5.1 m
<i>Approx. Height:</i>	3.7 m without support 5.0 m with support
<i>Approx. Weight:</i>	25 670 kg (dry)
<i>Inside Diameter</i>	3.6 m
<i>Tank Volume:</i>	60 m ³
<i>Service Fluid:</i>	Water
<i>Material Notes:</i>	304L / 316L with composition requirement: cobalt <0.20 wt%, Niobium < 0.1 wt% and Tantalum < 0.05 wt%.
<i>Anchoring system</i>	Embedded Plate/Bolting
<i>Component configuration</i>	On saddles
<i>Design Life Time:</i>	20 years
<i>Special Attributes</i>	Provided with an internal cooler and two spargers

WBS: IBED System

PBS: 26PHBD

Functional Reference: 26PHBD-TA-7001

GBS: 11-L4-04

REFERENCE DOCUMENTS

Sizing calculation: ITER_D_PAVZLW_v3.3

PID: ITER_D_SNJ3LL_v4_2

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>Related 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

ENVIRONMENTAL CONDITIONS

<i>Dose Rate:</i>	≤ 0.1 kGy/h
<i>Integrated Dose Rate 20yrs:</i>	10 kGy
<i>Magnetic Field:</i>	84 mT
<i>Normal temperature</i>	12 – 35 °C
<i>Normal Humidity</i>	≤ 65 %
<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 %

TA-7001 – Pressure Relief Tank

PARAMETERS PRT

Parameter	Value
Design Temperature (°C)	190
Design Pressure (MPa)	1.2
Thermal insulation thickness (mm)	50

PARAMETERS PRT Cooler

Parameter	Value
Design Temperature (°C)	190
Design Pressure (MPa)	1.72
Tank Water Temperature (°C)	60
Cooling Inlet Temperature (°C)	31
Cooling Flow Rate	22 kg/s
Required Power (kW)	333
Process Fouling (m ² °C/W)	50e-06
CCWS-1 Fouling (m ² °C/W)	100e-06

NOZZLE SCHEDULE

I.D.	DN / Schedule	Service
N1	DN 300 / 40S	Inlet from PRZ
N11	DN 25 / 40S	Nitrogen supply
N13	DN 25 / 40S	Demi-Water Supply
N12	DN 15 / 40S	Sampling
N20	DN 25 / 40S	Drain Line
N16	DN 150 / 40S	Inlet cooling water
N14	DN 150 / 40S	Outlet cooling water
N10	DN 15 / 40S	ML/MP sensor
N08	DN 15 / 40S	ML/MP sensor
N03	DN 300 / 40S	Inlet from PRVs header
N07	DN 50 / 40S	Inlet from Vent header
N17	DN 65 / 40S	Relief Valve
N04	DN 15 / 40S	H2 monitoring
N02	DN 65 / 40S	WCT Vent header
N18	DN 15 / 40S	MTW/MT 7001
N22	DN 15 / 40S	MTW/MT 7002
N06	DN 65 / 40S	Rupture Disk

Notes:

1. Approximate footprint is based on 3d model approved configuration.
2. All nozzles are butt-welded.
3. Initial amount of water is 30 m3.
4. The main inlet, from PRZ relief line, nozzle N01, shall be provided with a sparger that shall be submerged at a depth of 1000mm.
5. The inlet coming from the PRVs relief header, nozzle N03 shall be provided with a sparger, as note 5.
6. A cooler (HX-7001) is installed in the tank bottom to provide the required cooling power to the water.
7. For the Floor Response Spectra refer to Cover Main Document

