

IDM UID 3LE5Y9
VERSION CREATED ON / VERSION / STATUS 27 Mar 2023 / 2.0 / Approved
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)

<i>Approval Process</i>			
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<i>Document Security: Internal Use</i>			
<i>RO: Liocce 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

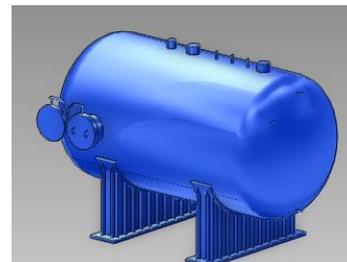
Arrangement 5 - PHBD Pressure Relief Tank (26PHBD-TA-7001) Equipment Summary (3LE5Y9)

<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

TA-7001 – Pressure Relief Tank

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

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 %

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

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

