

TORUS

· Owner

INTERDISCIPLINE CHECK RECORD

Document No.

GEN-RPT-003

Revision / Date

A · September 29, 2026

Issue purpose

Issued for Review

GENERAL · INTERDISCIPLINE CHECK RECORD

Rev.	Date	Revision description	Prepared	Reviewed	Approved
A	2026-09-29	Issued for Review			

Notes

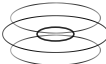
1. Before Revision A was issued, TORUS checked Volumes 1 to 9 against one another and against the Basis of Design GEN-DB-001. The check covered instrument and equipment tags, line numbers and sizes, setpoints, equipment positions, specification requirements, document cross-references, open-item numbers, writing and format rules, and drawing numbers.
2. Each check compared every instance across the package, 20,201 comparisons in all. The final run found no open inconsistencies.
3. Every finding was corrected in the document or drawing that carried it and in every document that depends on it. The resolutions that changed the design were incorporated into Revision A of the Basis of Design.

Table 1: Checks Performed

Check	Subject	Method	Items compared	Open at issue
1	Tags	Instrument index INS-LST-001 vs P&ID register PRO-LST-101 both ways; index P&ID sheet vs register sheets; every register tag found in the text of each P&ID sheet it names; tags in all datasheets, MEC-LST-002/003/005, load list, cable and panel schedules, I/O list, setpoint list, C&E and the five material take-offs against the tag registers; every P&ID valve in the valve list	6,111	0
2	Lines	P&ID register vs line list MEC-LST-001 (number, NPS, spec); every full line label in every document, drawing (including the isometrics and PRO-CAL-002) and MTO vs the register; the mechanical layout model lines vs the register; register decisions (1031/1032 NPS 12, S1 vent lines, 1051, 1060, 1072/1073, 1077, 1103, 1162, 1171); deleted 1150 and 1180 only in change-history wording	925	0
3	Setpoints and key values	Rule per value (text search) over all documents, drawing text and material take-offs: OPSS 1,250 psig, 192.201 limit 1,290 psig, SDV-102 stroke and allowable stroke, OPSS peak, PSV-101/157/161 sets, TT-156 HH, E-161, H-101 rating, V-101 ID, FCV noise, 1042 wall and length, hydrotest pressures; TIC-135 characterizer tables compared point by point with PRO-CAL-003 Table 7.8a; MEC-LST-002 weights vs civil and lift plans	479	0
4	Layout	Every (X, Y) quoted directly after a model equipment tag vs (centre or footprint); stale basis / earlier coordinates (T-101 (38, 100), JB-W01, ANT-201, IJ-102, tap, SDV-101, V-101); plan drawings take positions from the plot plan; pipe-support foundations vs the MEC-CAL-005 support schedule (ids, positions, counts) and run order	299	0
5	Specifications and codes	S1 butt-weld RT extent in SPC-007, SPC-008, SPC-019 and PIP-SPC-001 class S1; test pressures and holds by class and by test section vs MEC-CAL-003; carbon steel NDE extent; FBE thickness; CVN temperatures; S1 test water chloride limit and drying time	62	0
6	Cross-references	Every xxx-xxx-nnn cited in any document, drawing, MTO or INDEX.csv exists in an INDEX.csv (EST-* ignored); document titles quoted as “Title (…)” name the right number; master indexes GEN-LST-001/002 list every indexed number	7,792	0
7	HOLD ids	Every H-xx citation carries a keyword of that HOLD’s subject (basis Section 14, register Section 7); no HOLD above H-20; the liquids rate is cited as H-20, not H-12	1,608	0
8	Writing rules	Em dashes, banned words, YAML front matter, pipe tables of 10 columns or fewer, signature line, and wording that claims sealing, approval or vendor verification, over every.md, SVG text and MTO	2,264	0
9	Drawing and index integrity	SVG title-block number vs filename vs INDEX.csv; sheet number vs filename; INDEX.csv paths exist; every document and drawing indexed; INDEX.csv doc_no and title vs document front matter	661	0

Table 2: Findings and Resolutions

Item	Check	Documents	Finding	Resolution
F-1.1	1	INS-LST-001, PRO-LST-101	HV-191C still in the instrument index although it was deleted with line 1180; RO-102 and EV-193 on the P&IDs but not in the index	HV-191C removed; RO-102 and EV-193 added
F-1.2	1	MEC-LST-003, MEC-DS-006, MEC-LST-001, mechanical MTO, PIP GA / isos	SDV equalizing bypasses tagged HV-101H/J, HV-133E/F, HV-172C/D (two NPS 2 valves each) against the P&ID, index and process sizing: one NPS 1 globe each, HV-101H / HV-102H / HV-103H	Mechanical aligned to the P&ID: one NPS 1 socket-weld globe each (HV-101H Cv 5, HV-102H and HV-103H Cv 1, handwheel) on 1 in sockolets; HV-101J, HV-133E/F, HV-172C/D deleted
F-1.3	1	MEC-LST-003	RO-141 (should be RO-141A); P&ID package and instrument valves (MOV body bleeds HV-111A to 122A, HV-141x, HV-150A, HV-161B to 162B, SDV-141) missing from the valve list	RO-141A; valve list Section 6 lists every packaged / tubing valve by tag with its scope
F-1.4	1	MEC-DS-006, MEC-LST-005, mechanical MTO	HV-180A shown on deleted line 1180; drip pan carried an unregistered tag PAN-180	HV-180A is the VS-101 base drain valve (no line); pan untagged, listed under HV-180A
F-1.5	1	PRO-DS-009, MEC-DS-003	Single flame detector BE-153	BE-153A / BE-153B
F-1.6	1	ELE-CAL-001, ELE-RPT-001, INS-DWG-001	Burner safety shutoff valves tagged XV-153A/B/C; the P&ID tags are XV-150A/B/C	XV-150A/B/C
F-1.7	1	electrical MTO, ELE-LST-003	One heat-trace controller HTC-141 in the MTO; has two circuits (HTC-1080, HTC-1139); JB-110D, JB-110L, JB-140D used in the load list / MTO but not in the electrical equipment list	Two controllers HTC-1080 and HTC-1139; the three JB’s added to ELE-LST-003
F-1.8	1	INS-DS-012	Fuel gas filter DP gauge called PDI-161B; the P&ID tag is PDI-161A	PDI-161A
F-5.1	5	SPC-SPC-008, SPC-007, SPC-019, PIP-SPC-001 class S1, SPC log 8-19	Known conflict: SPC-008 applied a 10 % random RT (progressive sampling) to S1 stainless butt welds; basis Section 7 requires 100 % of butt welds	100 % RT (or UT where RT is impractical) of all S1 butt welds in all four documents; new hold point HP-08-08; ITP recompiled (193 inspection points); log 8-19 updated (PIP-SPC-001 has class S1)

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Item	Check	Documents	Finding	Resolution	
F-5.2	5	PIP-SPC-001, SPC-006, SPC-011	S1 hydrotest water: PIP-SPC-001 allowed drying within 7 days, SPC-006 required 24 h, SPC-011 gave only the general 250 mg/L chloride limit	All three: chloride 50 ppm maximum for S1 (TS-04), drained and dried within 24 h of completing the test	
F-5.3	5	PIP-SPC-001 6A.5 vs SPC-007 / SPC-008	S1 back purge 1 % oxygen and deposit ferrite FN 3 to 10 in PIP-SPC-001; the welding and NDE specs require 0.1 % (1,000 ppm) and FN 3 to 8	PIP-SPC-001 aligned to SPC-007 / SPC-008	
F-5.4	5	PIP-SPC-001 3.2 vs MEC-CAL-003	Allowable elevation difference per test section computed from the 2,175 psig target (103 ft) in PIP-SPC-001, from the 2,190 psig band top (69 ft) in MEC-CAL-003	Band top governs: 69 ft	
F-5.5	5	PIP-SPC-001 4.5, MEC-LST-001, mechanical MTO	PIP-SPC-001 said no other process insulation is required and the MTO had no acoustic insulation, against (acoustic insulation of FCV-131/132 bodies and 10 ft downstream mandatory)	Acoustic insulation made mandatory in PIP-SPC-001 and the line list; MTO items MEC-0218 (2 valve jackets) and MEC-0219 (20 ft NPS 12 acoustic pipe insulation) added (MTO correction logged)	
F-5.6	5	MEC-CAL-003, cal003_hydro	MEC-CAL-003 said the insulating-joint factory test in DS-008 was 2,160 psig and must be raised; DS-008 already specifies 2,225 psig	Statement, table and conclusion 5 corrected; test water totals refreshed (5,646 gal; 7,058 gal with allowance)	
F-5.7	5	SPC-016, SPC log 8-09, ELE-CAL-001, ELE-RPT-001, ELE-LST-003, electrical MTO, SAF-RPT-003	B-101 ventilation: SAF-RPT-003 requires 12 ACH (192 cfm minimum) and a 250 cfm exhaust fan; Vol 6 carried EF-101A/B at 150 cfm (8.3 ACH); SPC-016 said at least 6 ACH	EF-101A / EF-101B 250 cfm each, duty / standby (13.9 ACH at the 9 ft clear height), 12 ACH minimum in SPC-016; UH-101 5.0 -> 7.5 kW and AC-101 1.0 -> 1.5 ton for the added outdoor air; winter peak 36.7 kW / 40.1 kVA, G-101 at 62 % and XF-101 75 kVA still adequate; AC-101 branch 20 A/2P #10	
F-4.3	4	INS-DWG-001	RTU shown at the tap at the basis position (230, 260); the model tap is at (220, 257)	(220, 257)	
F-4.4	4	CIV-RPT-003, REG-RPT-004	SPCC transfer-piping row said 2 in L-1060 / L-1061 (D1) are buried; in the model 3"-L-1060-D1 and 2"-L-1061-A6/D1 run above grade on supports	Above grade on supports in both documents	
F-4.5	4	REG-RPT-004, REG log 9-10	REG said CIV-RPT-003 still shows a 10 ft tank and containment X 26 to 50 and adopted a 33 in wall; CIV-RPT-003 already carries the 9 ft 6 in tank, containment X 18 to 42 and a 30 in wall	REG adopts the civil 30 in wall (28 in required by the civil method, 26 in by the REG method); item closed	
F-8.2	8	MEA-CAL-004	“External pressure rating... is confirmed by the vendor’s PTC 19.3 calculation” reads as a vendor-verified claim	“is to be confirmed by the vendor’s...” (HOLD H-15)	
F-1.11	1	PRO-LST-101, PRO-DWG-101/107/108	HV-101H / HV-102H / HV-103H drawn without a valve type; the SDV-103 bypass had no line number	Drawn as NPS 1 Class 600 globe valves; 1"-G-1171-A6 added on DWG-108 and in the register; register intro now covers sheets 100 to 113	
F-2.1	2	MEC-LST-001, LST-003, PIP-DWG-001/010/013/014, the mechanical layout model, PRO-LST-101	Bypass lines 2"-G-1103-A6 and 2"-G-1162-A6 (MEC) vs 1" (P&ID); 2"-G-1171-A6 in the MEC documents but not on the P&IDs	All three lines NPS 1 A6 socket weld in the model, line list, valve list, GA and isometrics; 1171 on DWG-108 and in the register	
F-2.2	2	PRO-CAL-007, PRO-CAL-008	New PSV-161 outlet written 2"-V-1077-A1 and vent header 8"-V-1070-A1; makes both S1	2"-V-1077-S1, 8"-V-1070-S1	
F-2.4	2	SAF-RPT-001 (HAZOP)	Nodes quoted 8"-V-1070-A1 and 2"-V-1170-A1	S1	
F-3.3	3	PRO-DWG-107, PRO-DWG-002, SAF-RPT-001, REG-RPT-003, P&ID log	FCV noise quoted as 83.8 dBA (“with acoustic insulation”) and 86 dBA; : 86.1 dBA at 1 m with the 0.375 in wall, acoustic insulation of body and 10 ft downstream mandatory	86.1 dBA and the mandatory insulation note everywhere; REG noise screen recomputed from 86.1 dBA (500 / 1,000 / 1,500 / 2,640 ft: FCV 42.5 / 36.5 / 32.9 / 28.0 dBA; Ldn 51.0 / 45.0 / 41.5 / 36.6 dBA, below 55 dBA)	
F-3.4	3	SAF-RPT-001 (HAZOP)	H-101 listed at 5.0 MMBtu/h	6.0 MMBtu/h	
F-3.5	3	PRO-CAL-009	Design inputs quoted basis 8.1 as “SDV-102 stroke 10 s or less”; the basis now says 5 s or less	Input corrected; 10 s kept only as the sensitivity case that set	
F-3.7	3	MEC-DS-005	VS-101 hydrotest 1.5 x 275 = 413 psig; MEC-CAL-003 / PIP-SPC-001 set the S1 window at 415 to 420 psig (425 limit)	415 to 420 psig (TS-04)	
F-3.8	3	INS-LST-003 (FT-163)	Fuel meter high-flow alarm based on the 5.0 MMBtu/h heater (6.0 Mscf/h) is below the maximum demand with the 6.0 MMBtu/h heater (6.54 Mscf/h)	Alarm raised to 7.0 Mscf/h	
F-7.1	7	PRO-CAL-001, PRO-CAL-005, PRO-DS-010, PRO-RPT-001, PRO-DWG-002	Normal liquids rate cited as HOLD H-12 (gas analysis); the register created H-20 for the V-101 liquids rate	Liquids rate cites H-20; composition keeps H-12, pig slug H-16	