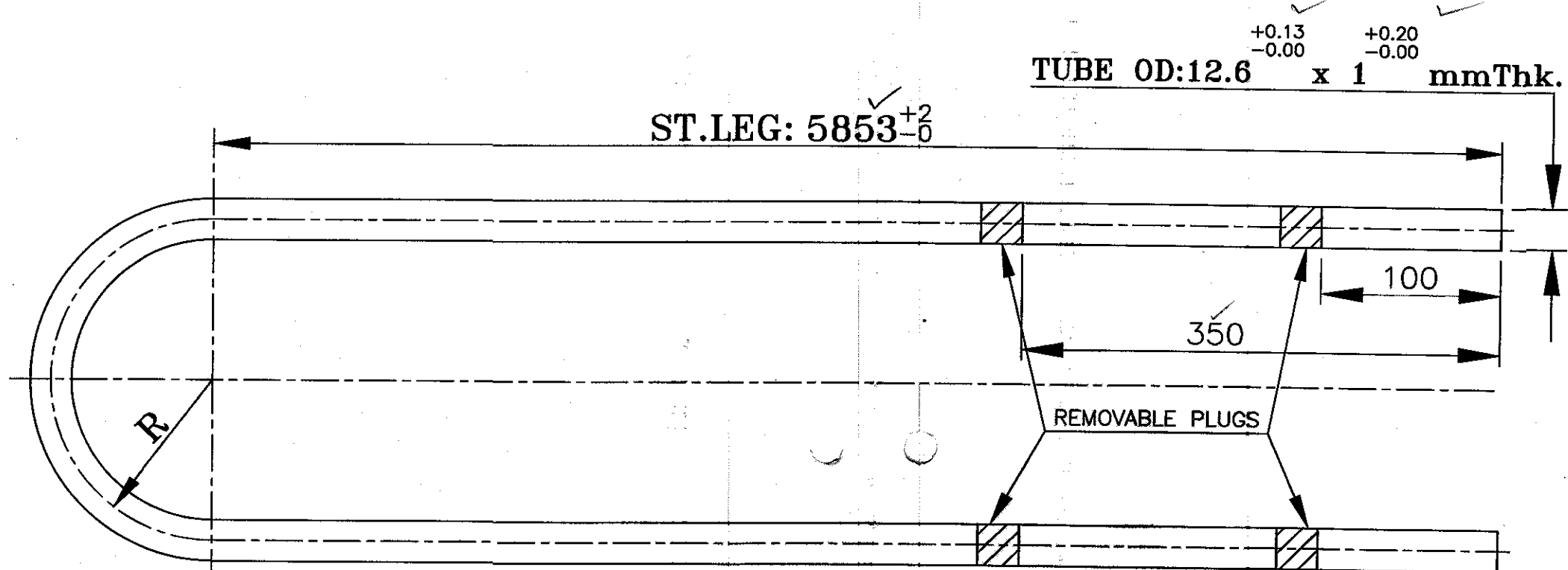




DETAIL OF ITEM 22 TO 97

(TOTAL No.OF ROWS: 76 Nos.)

NOTE

- TUBE MATERIAL SA213 TP 316L.
- TUBE SHALL BE SUPPLIED AS PER THE REQUIREMENT GIVEN IN SPECIFICATION NUMBER CDE-19-3407.
- TOLERANCE ON TUBE BENDS.
 - THINNING ALLOWANCE : 10% (MAX.) OF THE MINIMUM WALL THICKNESS.
 - OVALITY: 6% (MAX.)
- THE TUBES SHALL BE FREE FROM KINKS, BENDS, LOCAL DISTORTIONS ETC.
- TOLERANCE ON BEND RADIUS
 - $R < 300 \text{ mm} - \pm 0.75$
 - $R > 300 \text{ mm} - \pm 1.5$
- AFTER HEAT TREATMENT OF BEND PORTION + 150mm STRAIGHT LENGTH (BOTH SIDE) SHALL BE FREE FROM ANY SCALES, DISCOLORATION ETC. & PASSIVATED.
- NO. OF U-BEND TUBES ARE FOR ONE MOD. HEAT EXCHANGER = 4136.
- THE LEG SPACING MEASURED BETWEEN THE POINTS OF TANGENCY OF THE BEND TO THE LEGS SHALL HAVE TOLERANCE OF $\pm 1 \text{ mm}$ FOR BEND RADIUS (R) $< 220 \text{ mm}$, $\pm 1.6 \text{ mm}$ FOR $R > 220 \text{ mm}$ & $< 450 \text{ mm}$, $\pm 2 \text{ mm}$ FOR $R > 450 \text{ mm}$.
- ADEQUATE PROTECTION TO BE GIVEN FOR PREVENTING ENTRY OF FOREIGN MATERIAL INSIDE THE TUBE.
- HYDROSTATIC TEST PRESSURE SHALL BE 200 KG/sq.cm g .
- LOCATION OF MARKING FOR TUBE NUMBER, HEAT, ETC SHALL BE INDICATED AS GIVEN IN SPECIFICATION CDE-19-3407.
- FOUR NUMBERS REMOVABLE PLUG SHALL BE INSERTED INTO TUBE AS SHOWN. TUBE MANUFACTURE SHALL PROVIDE APPROPRIATE TOOLS FOR REMOVABLE OF PLUG.
- BOTH ENDS OF EACH TUBE SHALL BE CAPPED WITH HALOGEN FREE PLASTIC CAP.
- EACH TUBE SHALL BE PACKED IN HALOGEN FREE POLYTHENE SLEEVE AND HEAT SEALED ON BOTH ENDS.

ESTIMATED WEIGHTS & DEVELOPED LENGTHS.

ITEM No.	VAR.	TOTAL DEVLNGTH (M)	ESTIMATED WEIGHT(Kg)	No. OF TUBES	TUBE THK.
22 TO 97(R1-R76)	00	53360.8	16965.0	4136 ✓	1 MM(MIN)
22 TO 97(R1-R76)	01	54346.9	17278.5	4212 ✓	1 MM(MIN)

VAR.00 INDICATES QTY. OF TUBES REQUIRED FOR ONE MODERATOR.

VAR.01 INDICATES QTY. OF ONE EXTRA TUBE FOR EACH OF 76 ROWS OF ONE MODERATOR.

760	37	36	14093.6	97	TUBE (R76)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.48	399	57	56	12959.5	59	TUBE (R38)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.12
750.5	42	41	14063.8	96	TUBE (R75)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.47	389.5	58	57	12929.7	58	TUBE (R37)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.11
741	43	42	14033.9	95	TUBE (R74)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.46	380	57	56	12899.8	57	TUBE (R36)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.10
731.5	44	43	14004.1	94	TUBE (R73)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.45	370.5	58	57	12870.0	56	TUBE (R35)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.09
722	43	42	13974.2	93	TUBE (R72)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.44	361	59	58	12840.1	55	TUBE (R34)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.08
712.5	44	43	13944.4	92	TUBE (R71)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.43	351.5	58	57	12810.3	54	TUBE (R33)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.07
703	45	44	13914.5	91	TUBE (R70)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.42	342	59	58	12780.4	53	TUBE (R32)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.06
693.5	46	45	13884.7	90	TUBE (R69)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.41	332.5	60	59	12750.6	52	TUBE (R31)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.05
684	47	46	13854.8	89	TUBE (R68)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.40	323	59	58	12720.7	51	TUBE (R30)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.04
674.5	46	45	13825.0	88	TUBE (R67)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.40	313.5	60	59	12690.9	50	TUBE (R29)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.03
665	45	44	13795.2	87	TUBE (R66)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.39	304	59	58	12661.0	49	TUBE (R28)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.03
655.5	48	47	13765.3	86	TUBE (R65)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.38	294.5	60	59	12631.2	48	TUBE (R27)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.02
646	49	48	13735.5	85	TUBE (R64)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.37	285	61	60	12601.4	47	TUBE (R26)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.01
636.5	48	47	13705.6	84	TUBE (R63)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.36	275.5	60	59	12571.5	46	TUBE (R25)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.00
627	49	48	13675.8	83	TUBE (R62)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.35	266	59	58	12541.7	45	TUBE (R24)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.99
617.5	50	49	13645.9	82	TUBE (R61)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.34	256.5	60	59	12511.8	44	TUBE (R23)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.98
608	51	50	13616.1	81	TUBE (R60)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.33	247	59	58	12482.0	43	TUBE (R22)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.97
598.5	50	49	13586.2	80	TUBE (R59)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.32	237.5	60	59	12452.1	42	TUBE (R21)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.96
589	51	50	13556.4	79	TUBE (R58)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.31	228	59	58	12422.3	41	TUBE (R20)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.95
579.5	50	49	13526.6	78	TUBE (R57)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.30	218.5	62	61	12392.4	40	TUBE (R19)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.94
570	49	48	13496.7	77	TUBE (R56)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.29	209	61	60	12362.6	39	TUBE (R18)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.93
560.5	52	51	13466.9	76	TUBE (R55)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.28	199.5	62	61	12332.7	38	TUBE (R17)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.92
551	53	52	13437.0	75	TUBE (R54)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.27	190	61	60	12302.9	37	TUBE (R16)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.91
541.5	54	53	13407.2	74	TUBE (R53)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.26	180.5	62	61	12273.1	36	TUBE (R15)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.90
532	53	52	13377.3	73	TUBE (R52)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.25	171	61	60	12243.2	35	TUBE (R14)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.89
522.5	54	53	13347.5	72	TUBE (R51)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.24	161.5	62	61	12213.4	34	TUBE (R13)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.88
513	53	52	13317.6	71	TUBE (R50)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.23	152	61	60	12183.5	33	TUBE (R12)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.87
503.5	54	53	13287.8	70	TUBE (R49)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.22	142.5	62	61	12153.7	32	TUBE (R11)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.86
494	55	54	13257.9	69	TUBE (R48)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.22	133	63	62	12123.8	31	TUBE (R10)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.85
484.5	56	55	13228.1	68	TUBE (R47)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.21	123.5	62	61	12094.0	30	TUBE (R9)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.85
475	55	54	13198.3	67	TUBE (R46)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.20	114	63	62	12064.1	29	TUBE (R8)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.84
465.5	56	55	13168.4	66	TUBE (R45)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.19	104.5	62	61	12034.3	28	TUBE (R7)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.83
456	55	54	13138.6	65	TUBE (R44)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.18	95	62	61	12004.5	27	TUBE (R6)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.82
446.5	56	55	13108.7	64	TUBE (R43)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.17	85.5	62	61	11974.6	26	TUBE (R5)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.81
437	57	56	13078.9	63	TUBE (R42)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.16	76	63	62	11944.8	25	TUBE (R4)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.80
427.5	56	55	13049.0	62	TUBE (R41)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.15	66.5	62	61	11914.9	24	TUBE (R3)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.79
418	57	56	13019.2	61	TUBE (R40)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.14	57	63	62	11885.1	23	TUBE (R2)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.78
408.5	58	57	12989.3	60	TUBE (R39)	12.6 ODX1MM	1-16503-40831	B.O.	A	4.13	47.5	62	61	11855.2	22	TUBE (R1)	12.6 ODX1MM	1-16503-40831	B.O.	A	3.77

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NUCLEAR POWER CORPORATION OF INDIA LIMITED

(A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT : GORAKHPUR HARIYANA ANU VIDHYUT PARIYOJANA 1&2 (700 MWe)

NPCL PURCHASE ORDER NO. : CMM/FIP/10-32-1-1152/6-PO/30447, DATED 25.01.2019

NPCL DRAWING NO. : GHAVP-1&2/32111/2010/DD REV.01

ADDITIONAL INFORMATION DRG. LIST : 4-16503-40363 STATUS OF DRAWING W/O. NO. : 18083/84-W-04701 (U-1&2)		MODERATOR HEAT EXCHANGER NAME OF CUSTOMER/PROJECT BHARAT HEAVY ELECTRICALS LTD BHOPAL	
DISTRIBUTION OF PRINTS CDE - 1 HCM - 4 FWM - 4		REVISIONS REV. 01 DATE 25.03.19 CHECKED BY APPROVED BY	
U-TUBES DETAILS 1-16503-40831 01		SCALE 1:100	