	<p style="text-align: center;">Mandatory Appendix</p> <p style="text-align: center;">Appendix-II-TCPH-APB 3_04 Non Destructive Examination (NDE) Requirements</p>	<p style="text-align: center;">INDUS Ref. No. R34VABP</p>
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Sub-titel	MANDATORY APPENDIX : II-TCPH-APB3_04_NDE REQUIREMENTS

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1. SCOPE

This appendix covers the requirements for Non-Destructive Examinations (NDE) for TCPH manufacturing.

2. REFERENCE

- 2.1. ASME Sec-VIII, Div.2 Edition 2013
- 2.2. ASME Sec-V, Edition 2013
- 2.3. ITER Vacuum Hand book V 2.3 (RDB3_07)
- 2.4. ITER Vacuum Handbook: Attachment-1 V1.2 (RDB3_07)
- 2.5. Appendix 15 Vacuum Baking V1.4 (RDB3_07)

3. GENERAL REQUIREMENTS

The Non Destructive Examination (NDE) of TCPH shall be in accordance with requirements of ASME Sec-VIII, Div.2 and ASME Sec-V.

4. SPECIFIC REQUIREMENTS

The Non Destructive Examination (NDE) shall conform to requirement specified in ASME Section VIII, Division 2, with supplementary requirements in this specification.

4.1. Surface examination (Visual Examination and Liquid Penetrant Examination)


Surface examination for weld edge preparation (WEP) shall be carried out by visual examination. In case of doubt in visual examination, LPE shall be carried out. However, in case if LPE is required to be performed as per code or specification requirement, only ITER qualified LPE materials shall be used.

On welds forming the vacuum boundary, LPE shall be avoided. In case LPE is required to be performed as per code requirement, the Liquid Dye penetrant tested area shall be subsequently baked at T = 200 °C for a minimum of 24 hours prior to vacuum leak testing since the TCPH is VQC1A components (RDB3_07).

4.2. Volumetric examination

All vacuum boundary weld joints shall be 100% volumetrically examined. Radiography examination is the reference volumetric examination. Considering the plate thickness, Ultrasonic examination is permitted in lieu of Radiography examination as per rules specified in ASME Sec-VIII, Div.2.

In case the 100% volumetric examination is not achievable, the procedure for Production Proof Sample (PPS's) as outlined in the Vacuum Handbook shall be followed (Attachment-1 of ITER Vacuum Handbook shall be applicable).

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4.3. Vacuum Leak Testing

All vacuum boundary weld joints shall be 100% examined for Helium leak testing as per requirements specified in leak testing MANDATORY APPENDIX APB1_07 Leak Testing.

4.4. NDE for Weld Repairs

All applicable NDE shall be repeated for weld repair areas after repair welds are performed.

4.5. NDE for Temporary attachments

Temporary attachments welded on TCPH surface shall be examined for surface examination. The areas from which temporary attachments have been removed shall be dressed smooth and shall be examined by visual and liquid penetrant examination. Temporary attachment shall not be welded on vacuum surface at any condition.

4.6. NDE Operators and Inspectors Qualification:

The manufacturer shall be responsible for assuring that NDE personnel have been qualified and certified in accordance with their employer's written practice prior to performing or evaluating examinations.

Provisions for training, experience, qualification, and certification of NDE personnel shall be described in the Supplier's Quality Plan.

Personnel performing and evaluating nondestructive examination shall be ASNT Level-II in accordance with requirement specified in SNT-TC-1A as specified in ASME Sec-V.

5. DOCUMENTATION

Bidder shall submit non-destructive testing procedures and techniques in accordance with ASME Sec-VIII Div.2 and vacuum hand book requirements to I-I for approval

Bidder shall submit NDE qualification records to I-I for approval

Bidder shall submit all inspection reports as specified in II-TCPH-APB3_11_TCPH_Documentation_and_Acceptance_Requirements.