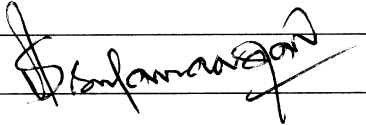


	QUALITY ASSURANCE		QCP : E : 002
	QUALITY CONTROL PROCEDURE FOR SPLICING NORMS FOR SHEETS / PLATES / STRUCTURALS APPLICABLE TO ESP COMPONENTS FABRICATION		Rev. No. 03
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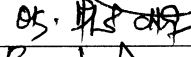
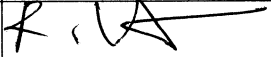
QUALITY CONTROL PROCEDURE

FOR SPLICING NORMS FOR SHEETS / PLATES / STRUCTURALS APPLICABLE TO
ESP COMPONENTS FABRICATION

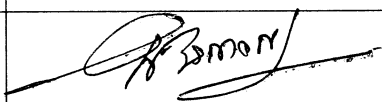
PREPARED BY :

DEPARTMENT	NAME & Designation S/Shri	SIGNATURE
QA	K. Jothi Arulanandam Dy.Mgr/QA	

REVIEWED BY:

DEPARTMENT	NAME & Designation S/Shri.	SIGNATURE
EDC / AQCS	C. Ganesh Sr.Mgr/AQCS	
OUT SOURCING	N. Nandagopal Sr.Mgr/OS	
QUALITY CONTROL	O. K. Abdulhuq Sr.Mgr/QC-OLI	
QUALITY ASSURANCE	R. Arunachalam Mgr/QA	

APPROVED BY

DEPARTMENT	NAME & Designation S/Shri	SIGNATURE
QA	G. BALASUBRAMANIAN SR.DGM / QA, QC(Proc.) & BE	

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03	30.05.2013	Amendment A1 merged. Feedback from OS and Engg (AQCS) Splicing Norms with applicable Drawing for carbon steel materials and SS Liner Sheet were added and re-issued.
02	03.03.2000	Feedback from MSA and Engg were included and re-issued.
01	16.06.1999	All amendments were merged, feedback from Engg and MSA were included and re-issued.
00	30.10.1985	Original Issue
REV. NO.	EFFECTIVE DATE	REVISIONS MADE

HISTORY OF RECORD OF REVISIONS

1.0 SCOPE

- 1.1 This Quality Control Procedure (QCP) specifies the requirements for splicing of sheets / plates / structural which may warrant joints to make the required length / width in order to achieve the final product as per drawing.
- 1.2 This QCP is applicable to Sheets / Plates / Structural – Angles, Beams of all types, Sections of Rolled / Built up, Rounds, Pipes and Tubes.
- 1.3 The splicing norms dealt in this QCP is applicable to following ESP components ;
 - 1.3.1 7X-X42 Outer Roof Assy
 - 1.3.2 7X-X44 Hopper Upper & Middle
 - 1.3.3 7X-X45 Hopper Lower with SS Liner Sheet
 - 1.3.4 7X-X46 Insulator Support Panels
 - 1.3.5 7X-X47 Inner Roof Panel Assy
 - 1.3.6 7X-X49 Casing Shell Panels
 - 1.3.7 7X-X50 Inlet / Outlet Funnel
- 1.4 This QCP covers both Carbon Steel and SS Liner Sheet materials applicable to ESP Components.

2.0 SPLICING NORMS - GENERAL POLICY

- 2.1 The fabricator or OS cutting plan section shall categorically try to avoid joints as much as possible with the supplied raw materials.
- 2.2 Further to explain the point no. 2.1 – the fabricator and OS cutting plan section shall try to make the supplied raw materials without any joints to cover up the loaded quantities – Eg., Out of 10 Nos of casing shell Panels loaded - maximum no. of panels shall be accommodated without any joints by fabricator and only to reduce the material wastage the balance quantity of casing shell panels shall be made with permitted joints as applicable.

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2.3 The joints permitted are considered with a following view only

- 2.3.1 To reduce the material wastage
- 2.3.2 To make the best use of supplied raw materials sizes without prejudice to appearance and quality of final product as applicable
- 2.3.3 Aesthetic appearance shall not be sacrificed in accommodating the splicing norms.
- 2.3.4 Splicing Joints shall be avoided where a cross member is meeting or on bolt hole region. This is to be strictly adhered by fabricator and shall study the drawing fully with all the matching components.

2.4 ESP Components where joints are not permitted

- 2.4.1 Shock Beam
- 2.4.2 Rapping Shaft
- 2.4.3 Vertical Beam
- 2.4.4 Foundation Bolt
- 2.4.5 Suspension Rod
- 2.4.6 Emitting Frame Top, Middle and Bottom
- 2.4.7 Collecting Suspension Arrangements
- 2.4.8 Lifting Holder
- 2.4.9 Vertical Stay
- 2.4.10 Shock bar

3.0 SPLICING NORMS – SPECIFIC TO RAW MATERIALS

3.1 SHEETS / PLATES (CARBON STEEL)

- 3.1.1 The preparation of joints shall be staggered one so that formation of (+) plus type joint is avoided. The minimum offset (staggering) to avoid the plus type joint shall be minimum 100mm.
- 3.1.2 For a surface area including 2 Mtr X 2 Mtr and less - the permitted smallest dimension of any piece shall be minimum 400 mm (either length wise or breadth wise) and the same will be 600mm minimum for more than 2 Mtr X 2 Mtr surface area – Refer sketch - S1
- 3.1.3 The distance between nearest stiffener and the joint parallel to it shall be minimum 50mm – Refer sketch – S1
- 3.1.4 The vertical joint is permitted on the taper portion. However the distance between meeting of the vertical joint with the horizontal joint shall be minimum 100mm – Refer sketch – S1
- 3.1.5 Butt weld reinforcement shall be ground flush wherever stiffeners cross them.
- 3.1.6 When bending of the plate is done before welding, the parallel joints shall be minimum 100 mm away from the bend line. The weld quality shall be ensured by

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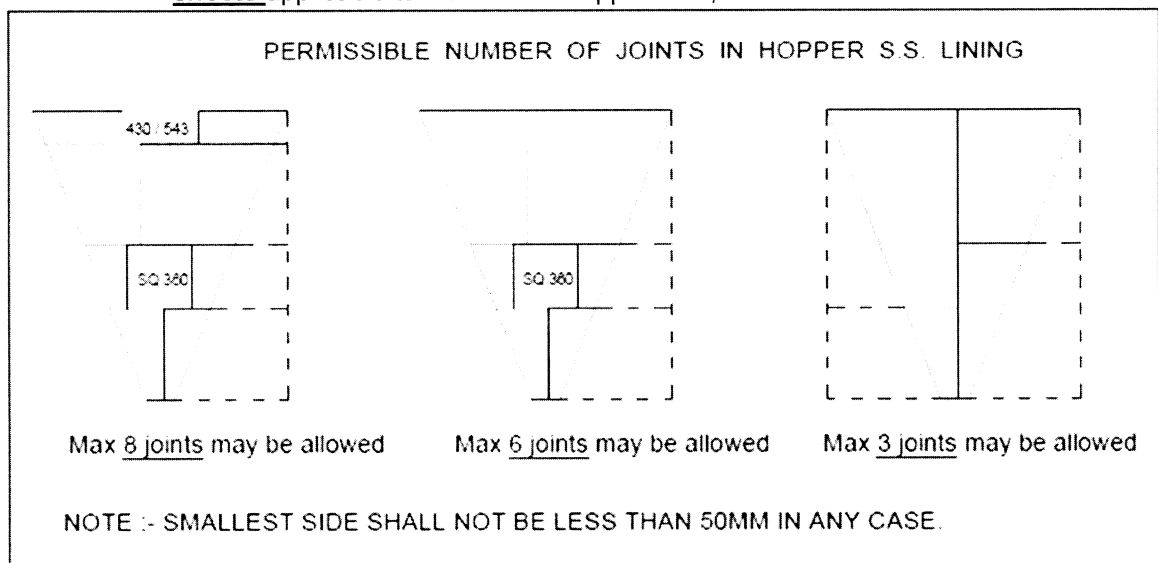
MPI / LPI. If the weld joint is subjected to bend, the weld shall be checked by LPI subsequent to bending.

- 3.1.7 The maximum number of permitted joints shall be as given below for carbon steel sheets / plates

Sl. No.	Surface Area in Sq. Mtr	Maximum No. Of joints permitted put together both axis (X & Y)
1	Less than & Up to 2	1
2	More than & Up to $> 2 < 5$	3
3	More than & Up to $> 5 < 10$	6
4	More than & Up to $> 10 < 15$	7
5	More than & Up to $> 15 < 20$	9
6	More than & Up to $> 20 < 25$	11
7	More than & Up to $> 25 < 30$	13
8	More than > 30	15

NOTE: The above permitted joints supersedes the maximum no. of joints given in clause no. 4.13 & 4.14 of SQP:ESP:284 Rev.01 Dtd.06.06.2007

- 3.1.8 The maximum number of permitted joints shall be as given below for **SS Liner sheets** applicable to ESP Lower hopper area;



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3.2 ANGLES, CHANNELS, BEAMS (BOTH ROLLED / BUILT UP - INCLUDING NPB&UB) APPLICABLE TO ESP ROOF BEAMS & SUPPORTING COLUMNS 7X-X28 and 7X-X81, 82, 83 & 84

- 3.2.1 The splicing norms for Angles, Channels and Beams (both rolled / built-up) shall be strictly followed as per the drawing no.1-79-081-02331 Rev.00.
- 3.2.2 Any change other than given in above referred drawing shall be approved by Engg (AQCS) and the request for the same shall be forwarded by cutting plan section of OS Dept.
- 3.2.3 Only one joint is permitted on the transverse roof beams.

3.3 “ H “ BEAMS APPLICABLE TO CASING STRUCTURE COLUMNS – 7X-X48 (BOTH ROLLED / BUILT UP)

- 3.3.1 The splicing norms for “H” Beams shall be strictly followed as per the drawing no. 4-79-000-00763 Rev.00.
- 3.3.2 Maximum two joints ie., one for shop and another for site / field shall be permitted for a maximum length of 16.5 Mtr of section considering ODC constraints.
- 3.3.3 Joints on flange shall be staggered by minimum 300 mm avoiding falling of joint on the same side of the built up sections.
- 3.3.4 The splice plate provided for web joints shall not foul with the gusset plates provided on the “H” beams and a minimum clearance of 50 mm shall be maintained.
- 3.3.5 The minimum distance permissible between a joint and the nearest gusset / bracket location shall be 200mm.

3.4 RODS, ROUNDS, PIPS AND TUBES

- 3.4.1 No joint is permitted if the length of rod is 2 M or less.
- 3.4.2 Minimum length for splicing using sleeve shall be 500mm for tubes
- 3.4.3 Only one joint is permitted for Tie Rods / Strut

4.0 EDGE PREPARATION, WELDING, WELD NDE DETAILS :

- 4.1 Check for material specification of plates / sections which are to be joined to avoid mix up of material. TCN to be obtained for change of material.
- 4.2 Electrode selection shall be as per the respective WPS.

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- 4.3 Welding shall be followed with suitable methods of sequence and controls to minimize the weld distortion.
- 4.4 Weld over joint shall be avoided and minimum distance between stiffeners parallel to weld joint is 50mm.
- 4.5 Wherever, back grinding is not feasible due to location of the plate / sheet, root welding to be carried out with 3.15mm electrode and LPI to be carried out after thorough cleaning and repeat LPI after final welding.
- 4.6 Following are the guidelines for Edge Preparation (EP) if not specified in drawing;
- a) **Plates / Sheets up to 5mm** : No EP required. Provide 2 to 3 mm root gap, weld on both sides. MPI to be conducted after final welding.
 - b) **Plates of 6 mm** : No EP required. Weld shall be with square butt with 2 to 3 mm gap. Weld from first side and turn the plate for back grinding and conduct root LPI. Complete the weld and conduct the final MPI.
 - c) **Plates of 7 & 8 mm** : Single "V" , 60° EP, Weld from V side and turn the plate, back grind and conduct LPI, complete the Weld. Final MPI.
 - d) **Plates above 8 mm** : Double "V" , 60° EP, Weld one side, Carryout back grind and conduct LPI to ensure sound metal and weld from other side. Final both side MPI after completion of weld.
 - e) **For Structural (Angle, Channel, Beam)** : Single "V" , 60° EP, Weld from V side and back grind and conduct LPI. Complete the weld, conduct final LPI before splice plate setting.

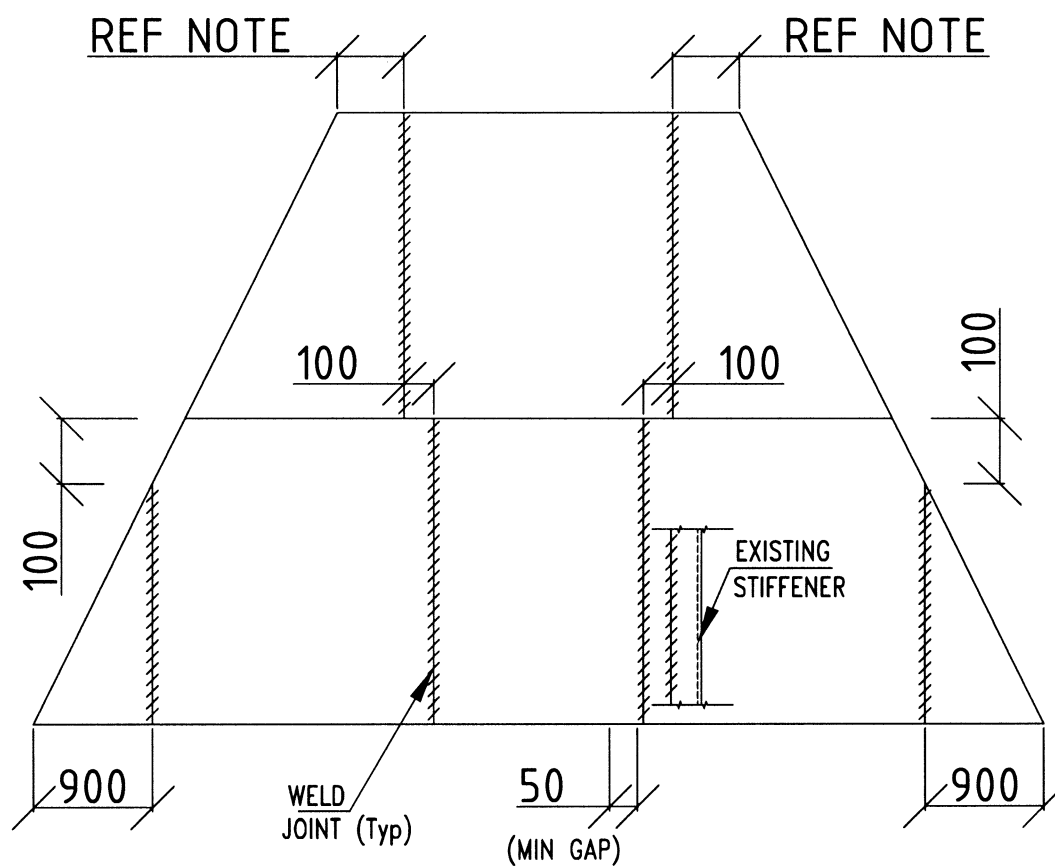
Note:

1. Splice plate details shall be taken from relevant fabrication Engg drawing.
2. Splice Joint shall be avoided where a cross member is meeting.
3. The weld should be ground flush and smooth and the proper splice plate is placed & welded.

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QUALITY CONTROL PROCEDURE FOR SPLICING OF SHEETS,
PLATES AND OTHER STRUCTURAL ITEMS

SKETCH FOR CLAUSES 3.1.2 TO 3.1.4



NOTE : MINIMUM DIMENSION OF SPLICED PLATE = 200 MM FOR
DUCT WALL OF ANY SIZE

ALL DIMENSIONS ARE IN MM

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