FORM QEXP-1 TUBE EXPANDING PROCEDURE SPECIFICATION (TEPS)

1	Company Name:				By:	
2	Tube Expanding Procedure Specification No.		Date		Supporting TEPQR No.(s)	
3	Revision No.		Date			
4	Expanding Process(es)			Driver Type(s)		

JOINTS

5	Measurement and Control of Tube Hole		Tube Pitch	
6	Tube Hole Diameter and Tolerance		Maximum Tube to Hole Clearance Before Expanding	
7	Ratio Tube Diameter/Tube Wall Thickness		Minimum Ratio Drilling Pitch/Tube Diameter	
8	Maximum % Wall Reduction		Minimum % Wall Reduction	
9	Maximum Permissible Deviation from Specified Hole Diameter		Maximum Permissible % of Holes that Deviate	
10	Details of Tube End Hole Enhancement and/or Tube End Enhancement		Minimum Ratio Tubesheet Thickness/Tube Diameter	
11	Method of Fixing Tubes in Position		Length of Expansion	
12	Setback from Front Tubesheet Face Before Start of Expanding		Setback from Rear Tubesheet Face After Expanding	
13	Method of Removing Weld Droop		Method of Tube End and Hole Cleaning	
14	Other Joint Details:			

EXPANDING EQUIPMENT

15	Manufacturer(s), Model No.(s), Range of Tube Diameters and Thicknesses, Maximum Torque Output or Pressure.			
16	Expanding Tool Model and Description			
17	Expanded Length per Application of Expanding Mandrel		No. of Applications/ Expanded Length	
18	Torque or Pressure Calibration System and Frequency		Explosive Charge and No.(s) of Applications	

PROPERTIES

19	Range of Tube Elastic Modulus			Range of Plate Elastic Modulus		
20	Range of Tube Yield Stress (mill test report values)	Min.			Max.	
21	Range of Tubesheet Yield Stress (mill test report values)	Min.			Max.	
22	Minimum Tubesheet Yield Stress/Tube Yield Stress NOTE: Values below 0.6 require shear load testing.					

TUBES

23	Diameter Range		Thickness Range		Maximum Ratio Tube Diameter/Thickness	
24	Material Specifications					

TUBESHEETS

25	Thickness Range		Minimum Ratio of Tubesheet Thickness to Tube Diameter	
26	Material Specifications			
27	**REMARKS:**			