STYRENE PARK OFFSITE

Document Title:

Work Breakdown Structure (WBS)

00	11-Aug-24	IFA	S.Baitar	H.Zahiri	H.Zahiri
Rev.	**Issued Date**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**

Page	Revisions						
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1	X						
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	Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co. **CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE**	
	Document Title: Work Breakdown Structure (WBS)	
	Document No. : EI027-FPA-VD-PL-WBS-001	Rev.: R0

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1	**Shell & Tube Heat exchanger**		**100**
1.1	**Engineering**	**100%**	**10**
1.1.1	Vendor Print Index & Schedule (VPIS)	3%	0.3
1.1.2	Sub-Vendor List (SVL)	5%	0.5
1.1.3	Final vendor Data Book Index	3%	0.3
1.1.4	Final vendor Data Book	5%	0.5
1.1.5	HSE Plan	4%	0.4
1.1.6	WBS for Shell & Tube Heat Exchangers	5%	0.5
1.1.7	Time Schedule for Shell & Tube Heat Exchangers	7%	0.7
1.1.8	Monthly Progress Report for Shell & Tube Heat Exchangers	5%	0.5
1.1.9	As Built Drawing	13%	1.3
1.1.10	Inspection & Test Plan (ITP)	5%	0.5
1.1.11	Welding Document (WPS & PQR)	8%	0.8
1.1.12	Welding & NDT Map	7%	0.7
1.1.13	NDT Operator Qualification	7%	0.7
1.1.14	Welder Performance Qualification	5%	0.5
1.1.15	NDT Procedure (RT, UT, PT, MT)	6%	0.6
1.1.16	Hydrostatic Test Procedure	7%	0.7
1.1.17	Surface Preparation & Painting Procedure	5%	0.5
1.2	**Procurement**	**100%**	**40**
1.2.1	Plate	23%	9.2
1.2.1.1	PO placement	25%	2.3
1.2.1.2	Fabrication	65%	6.0
1.2.1.3	Shipping	7%	0.6
1.2.1.4	Custom clearance	3%	0.3

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.2.2	Head	20%	8
1.2.2.1	PO placement	25%	2.0
1.2.2.2	Fabrication	65%	5.2
1.2.2.3	Shipping	7%	0.6
1.2.2.4	Custom clearance	3%	0.2
1.2.3	U-Tube	19%	7.6
1.2.3.1	PO placement	25%	1.9
1.2.3.2	Fabrication	65%	4.9
1.2.3.3	Shipping	7%	0.5
1.2.3.4	Custom clearance	3%	0.2
1.2.4	Tube sheet	7%	2.8
1.2.4.1	PO placement	25%	0.7
1.2.4.2	Fabrication	65%	1.8
1.2.4.3	Shipping	7%	0.2
1.2.4.4	Custom clearance	3%	0.1
1.2.5	Baffle	5%	2
1.2.5.1	PO placement	25%	0.5
1.2.5.2	Fabrication	65%	1.3
1.2.5.3	Shipping	7%	0.1
1.2.5.4	Custom clearance	3%	0.1
1.2.6	Elbow	2%	0.8
1.2.6.1	PO placement	25%	0.2
1.2.6.2	Fabrication	65%	0.5
1.2.6.3	Shipping	7%	0.1
1.2.6.4	Custom clearance	3%	0.0

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.2.7	Pipe	9%	3.6
1.2.7.1	PO placement	25%	0.9
1.2.7.2	Fabrication	65%	2.3
1.2.7.3	Shipping	7%	0.3
1.2.7.4	Custom clearance	3%	0.1
1.2.8	Flange	7%	2.8
1.2.8.1	PO placement	25%	0.7
1.2.8.2	Fabrication	65%	1.8
1.2.8.3	Shipping	7%	0.2
1.2.8.4	Custom clearance	3%	0.1
1.2.9	Spacer	3%	1.2
1.2.9.1	PO placement	25%	0.3
1.2.9.2	Fabrication	65%	0.8
1.2.9.3	Shipping	7%	0.1
1.2.9.4	Custom clearance	3%	0.0
1.2.10	Nut & bolt	2%	0.8
1.2.10.1	PO placement	25%	0.2
1.2.10.2	Fabrication	65%	0.5
1.2.10.3	Shipping	7%	0.1
1.2.10.4	Custom clearance	3%	0.0
1.2.11	Gasket	1%	0.4
1.2.11.1	PO placement	25%	0.1
1.2.11.2	Fabrication	65%	0.3
1.2.11.3	Shipping	7%	0.0
1.2.11.4	Custom clearance	3%	0.0

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.2.12	Paint	1%	0.4
1.2.12.1	PO placement	25%	0.1
1.2.12.2	Fabrication	65%	0.3
1.2.12.3	Shipping	7%	0.0
1.2.12.4	Custom clearance	3%	0.0
1.2.13	Name plate	1%	0.4
1.2.13.1	PO placement	25%	0.10
1.2.13.2	Fabrication	65%	0.26
1.2.13.3	Shipping	7%	0.03
1.2.13.4	Custom clearance	3%	0.01
1.3	**Fabrication**		**50**
1.3.1	RU-0001A-E-02	50%	25
1.3.1.1	Prefabrication	40%	10
1.3.1.1.1	Shell	35%	3.5
1.3.1.1.1.1	Cutting	10%	0.4
1.3.1.1.1.2	Beveling	10%	0.4
1.3.1.1.1.3	Rolling	15%	0.5
1.3.1.1.1.4	Assembly (LW)	25%	0.9
1.3.1.1.1.5	Welding (LW)	35%	1.2
1.3.1.1.1.6	Reroll	5%	0.2
1.3.1.1.2	Channel	15%	1.5
1.3.1.1.2.1	Cutting	10%	0.2
1.3.1.1.2.2	Beveling	10%	0.2
1.3.1.1.2.3	Rolling	15%	0.2
1.3.1.1.2.4	Assembly (LW)	25%	0.4

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.1.1.2.5	Welding (LW)	35%	0.5
1.3.1.1.2.6	Reroll	5%	0.1
1.3.1.1.3	Cone	20%	2
1.3.1.1.3.1	Cutting	10%	0.2
1.3.1.1.3.2	Beveling	10%	0.2
1.3.1.1.3.3	Rolling	15%	0.3
1.3.1.1.3.4	Assembly (LW)	25%	0.5
1.3.1.1.3.5	Welding (LW)	35%	0.7
1.3.1.1.3.6	Reroll	5%	0.1
1.3.1.1.4	Saddle fabrication	10%	1
1.3.1.1.4.1	Cutting	10%	0.1
1.3.1.1.4.2	Beveling	10%	0.1
1.3.1.1.4.3	Rolling	15%	0.15
1.3.1.1.4.4	Assembly (LW)	25%	0.25
1.3.1.1.4.5	Welding (LW)	35%	0.35
1.3.1.1.4.6	Reroll	5%	0.05
1.3.1.1.5	Nozzle fabrication (part 1)	8%	0.8
1.3.1.1.5.1	Pipe cutting	15%	0.12
1.3.1.1.5.2	Pipe beveling	15%	0.12
1.3.1.1.5.3	Assembly pipe to flange	25%	0.2
1.3.1.1.5.4	Welding pipe to flange	45%	0.36
1.3.1.1.6	Nozzle fabrication (part 2)	12%	1.2
1.3.1.1.6.1	Pipe cutting	5%	0.06
1.3.1.1.6.2	Pipe beveling	5%	0.06
1.3.1.1.6.3	Assembly pipe to flange	15%	0.18

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.1.1.6.4	Welding pipe to flange	35%	0.42
1.3.1.1.6.5	Assembly elbow to pipe	10%	0.12
1.3.1.1.6.6	Welding elbow to pipe	30%	0.36
1.3.1.2	Final assembly	50%	12.5
1.3.1.2.1	Shell	40%	5
1.3.1.2.1.1	Assembly shell segments (CW)	12%	0.6
1.3.1.2.1.2	Welding shell segments (CW)	27%	1.35
1.3.1.2.1.3	Opening for nozzle assembly	5%	0.25
1.3.1.2.1.4	Nozzle assembly to shell	5%	0.25
1.3.1.2.1.5	Nozzle welding to shell	10%	0.5
1.3.1.2.1.6	Assembly head to shell	3%	0.15
1.3.1.2.1.7	Welding head to shell	7%	0.35
1.3.1.2.1.8	Assembly cone to shell	3%	0.15
1.3.1.2.1.9	Welding cone to shell	7%	0.35
1.3.1.2.1.10	Assembly segment shell to cone	3%	0.15
1.3.1.2.1.11	Welding segment shell to cone	8%	0.4
1.3.1.2.1.12	Assembly body flange to shell	3%	0.15
1.3.1.2.1.13	Welding body flange to shell	7%	0.35
1.3.1.2.2	Channel	15%	1.88
1.3.1.2.2.1	Assembly head to channel	10%	0.19
1.3.1.2.2.2	Welding head to channel	20%	0.38
1.3.1.2.2.3	Assembly body flange to channel	10%	0.19
1.3.1.2.2.4	Welding body flange to channel	20%	0.38
1.3.1.2.2.5	Opening for nozzle assembly	10%	0.19
1.3.1.2.2.6	Assembly nozzle to channel	10%	0.19

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.1.2.2.7	Welding nozzle to channel	20%	0.38
1.3.1.2.3	Bundle structure	45%	5.63
1.3.1.2.3.1	Assembly bundle structure	15%	0.84
1.3.1.2.3.2	Insert tube to bundle structure	10%	0.56
1.3.1.2.3.3	Tube to tube sheet welding	30%	1.69
1.3.1.2.3.4	Expanding	5%	0.28
1.3.1.2.3.5	Insert bundle to shell	2%	0.11
1.3.1.2.3.6	Assembly tube sheet to shell	5%	0.28
1.3.1.2.3.7	Welding tube sheet to shell	10%	0.56
1.3.1.2.3.8	Assembly saddle to shell	5%	0.28
1.3.1.2.3.9	Welding saddle to shell	10%	0.56
1.3.1.2.3.10	Assembly external part to shell& channel	2%	0.11
1.3.1.2.3.11	Welding external part to shell& channel	4%	0.23
1.3.1.2.3.12	Final NDT	2%	0.11
1.3.1.3	Test	5%	1.25
1.3.1.3.1	Hydrostatic Test	100%	1.25
1.3.1.4	Sandblast & paint	5%	1.25
1.3.1.4.1	Sandblast	50%	0.63
1.3.1.4.2	Painting	50%	0.63
1.3.2	RU-0001A-E-02	50%	25
1.3.2.1	Prefabrication	40%	10
1.3.2.1.1	Shell	35%	3.5
1.3.2.1.1.1	Cutting	10%	0.4
1.3.2.1.1.2	Beveling	10%	0.4
1.3.2.1.1.3	Rolling	15%	0.5

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.2.1.1.4	Assembly (LW)	25%	0.9
1.3.2.1.1.5	Welding (LW)	35%	1.2
1.3.2.1.1.6	Reroll	5%	0.2
1.3.2.1.2	Channel	15%	1.5
1.3.2.1.2.1	Cutting	10%	0.2
1.3.2.1.2.2	Beveling	10%	0.2
1.3.2.1.2.3	Rolling	15%	0.2
1.3.2.1.2.4	Assembly (LW)	25%	0.4
1.3.2.1.2.5	Welding (LW)	35%	0.5
1.3.2.1.2.6	Reroll	5%	0.1
1.3.2.1.3	Cone	20%	2
1.3.2.1.3.1	Cutting	10%	0.2
1.3.2.1.3.2	Beveling	10%	0.2
1.3.2.1.3.3	Rolling	15%	0.3
1.3.2.1.3.4	Assembly (LW)	25%	0.5
1.3.2.1.3.5	Welding (LW)	35%	0.7
1.3.2.1.3.6	Reroll	5%	0.1
1.3.2.1.4	Saddle fabrication	10%	1
1.3.2.1.4.1	Cutting	10%	0.1
1.3.2.1.4.2	Beveling	10%	0.1
1.3.2.1.4.3	Rolling	15%	0.15
1.3.2.1.4.4	Assembly (LW)	25%	0.25
1.3.2.1.4.5	Welding (LW)	35%	0.35
1.3.2.1.4.6	Reroll	5%	0.05
1.3.2.1.5	Nozzle fabrication (part 1)	8%	0.8

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.2.1.5.1	Pipe cutting	15%	0.12
1.3.2.1.5.2	Pipe beveling	15%	0.12
1.3.2.1.5.3	Assembly pipe to flange	25%	0.2
1.3.2.1.5.4	Welding pipe to flange	45%	0.36
1.3.2.1.6	Nozzle fabrication (part 2)	12%	1.2
1.3.2.1.6.1	Pipe cutting	5%	0.06
1.3.2.1.6.2	Pipe beveling	5%	0.06
1.3.2.1.6.3	Assembly pipe to flange	15%	0.18
1.3.2.1.6.4	Welding pipe to flange	35%	0.42
1.3.2.1.6.5	Assembly elbow to pipe	10%	0.12
1.3.2.1.6.6	Welding elbow to pipe	30%	0.36
1.3.2.2	Final assembly	50%	12.5
1.3.2.2.1	Shell	40%	5
1.3.2.2.1.1	Assembly shell segments (CW)	12%	0.6
1.3.2.2.1.2	Welding shell segments (CW)	27%	1.35
1.3.2.2.1.3	Opening for nozzle assembly	5%	0.25
1.3.2.2.1.4	Nozzle assembly to shell	5%	0.25
1.3.2.2.1.5	Nozzle welding to shell	10%	0.5
1.3.2.2.1.6	Assembly head to shell	3%	0.15
1.3.2.2.1.7	Welding head to shell	7%	0.35
1.3.2.2.1.8	Assembly cone to shell	3%	0.15
1.3.2.2.1.9	Welding cone to shell	7%	0.35
1.3.2.2.1.10	Assembly segment shell to cone	3%	0.15
1.3.2.2.1.11	Welding segment shell to cone	8%	0.4
1.3.2.2.1.12	Assembly body flange to shell	3%	0.15

Work Breakdown Structure (WBS)

Level No.(*)	Description	Weight Factor (%)	
1.3.2.2.1.13	Welding body flange to shell	7%	0.35
1.3.2.2.2	Channel	15%	1.88
1.3.2.2.2.1	Assembly head to channel	10%	0.19
1.3.2.2.2.2	Welding head to channel	20%	0.38
1.3.2.2.2.3	Assembly body flange to channel	10%	0.19
1.3.2.2.2.4	Welding body flange to channel	20%	0.38
1.3.2.2.2.5	Opening for nozzle assembly	10%	0.19
1.3.2.2.2.6	Assembly nozzle to channel	10%	0.19
1.3.2.2.2.7	Welding nozzle to channel	20%	0.38
1.3.2.2.3	Bundle structure	45%	5.63
1.3.2.2.3.1	Assembly bundle structure	15%	0.84
1.3.2.2.3.2	Insert tube to bundle structure	10%	0.56
1.3.2.2.3.3	Tube to tube sheet welding	30%	1.69
1.3.2.2.3.4	Expanding	5%	0.28
1.3.2.2.3.5	Insert bundle to shell	2%	0.11
1.3.2.2.3.6	Assembly tube sheet to shell	5%	0.28
1.3.2.2.3.7	Welding tube sheet to shell	10%	0.56
1.3.2.2.3.8	Assembly saddle to shell	5%	0.28
1.3.2.2.3.9	Welding saddle to shell	10%	0.56
1.3.2.2.3.10	Assembly external part to shell& channel	2%	0.11
1.3.2.2.3.11	Welding external part to shell& channel	4%	0.23
1.3.2.2.3.12	Final NDT	2%	0.11
1.3.2.3	Test	5%	1.25
1.3.2.3.1	Hydrostatic Test	100%	1.25
1.3.2.4	Sandblast & paint	5%	1.25

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Level No.(*)	Description	Weight Factor (%)	
1.3.2.4.1	Sandblast	50%	0.63
1.3.2.4.2	Painting	50%	0.63