Analysis of manpower and time required to erect tank shells of various sizes under different erection and horizontal welding methods

		Welding Method								Jacking Method of Erection		Conventional Erection Method			Conventional + Manual Welding	Conventional + Automatic Welding	Plain Vanilla Jacking + Manual Welding	Jacking + External Welds by Auto Welding + Internal Welds manually	'LIFT n WELD' (Jacking + Auto Welding for both external and internal Welds)	% Reduction Compared to manual Welding(C-E)	% Reduction in man days compared to conventional method (B-E)	
Tank Diameter (meters)	Weld Joint Between Plates of Two Thicknesses (Average) (mm)			No. Of Weld Passes INCL Root Pass	Welding Speed Per Machine / Per Welder (mtrs/ Min)	No. of Auto Welding Machines / No. Of Manual Welders	Working Hrs Per Day	Total Day Required For Horizontal Welding	No. of Welders And Helpers Required For Welding	Days for Placing And Erecting Shell Plates, Aligning And Vertical Welding	No. of Fitters / Riggers And Other Helpers Required	Days for Placing And Erecting Shell Plates, Aligning And Vertical Welding	No. of Fitters / Riggers And Other Helpers Required		A	B	C	D	E	(C-E)	(B-E)	
20	10 to 12	SAW	External	4	0.4	1	10	1.05	4	2	16	4	24	Total days for 1(one) shell course	8.07	5.83	6.07	4.79	3.83			
			Internal	3		1		0.79						Total manpower required	34.00	28.00	26.00	21.00	20.00	23.08	28.57	Lesser workmen required
		SMAW	External	4	0.045	4		2.33	10					Total days to erect 6 shell courses	48.44	35.00	36.44	28.76	23.00	36.89	34.29	Lesser time for shell erection
			Internal	3		4		1.75						Total man days for shell	1,646.88	979.92	947.38	603.90	459.94	51.45	53.06	
30	14 to 16	SAW	External	6	0.4	2	10	1.18	6	2	21	4	28	Total days for 1(one) shell course	11.68	6.16	9.68	6.67	4.16			
			Internal	5		2		0.98						Total manpower required	40.00	34.00	33.00	27.00	27.00	18.18	20.59	Lesser workmen required
		SMAW	External	6	0.045	5		4.19	12					Total days to erect 6 shell courses	70.08	36.96	58.08	40.02	24.96	57.03	32.47	Lesser time for shell erection
			Internal	5		5		3.49						Total man days for shell	2,803.31	1256.67	1,916.73	1,080.44	673.94	64.84	46.37	
50	18 to 20	SAW	External	7	0.4	3	10	1.53	8	5	28	8	37	Total days for 1(one) shell course	19.64	10.62	16.64	11.38	7.62			
			Internal	5		3		1.09						Total manpower required	52.00	45.00	43.00	35.50	36.00	16.28	20.00	Lesser workmen required
		SMAW	External	7	0.045	6		6.79	15					Total days to erect 6 shell courses	117.82	63.71	99.82	68.26	45.71	54.21	28.25	Lesser time for shell erection
			Internal	5		6		4.85						Total man days for shell	6,126.76	2,866.95	4,292.36	2,423.11	1,645.56	61.66	42.60	
80	24 to 26	SAW	External	8	0.4	5	10	1.68	12	8	40	11	54	Total days for 1(one) shell course	22.64	14.14	19.64	15.11	11.14			
			Internal	7		5		1.47						Total manpower required	81.00	66.00	67.00	53.50	52.00	22.39	21.21	Lesser workmen required
		SMAW	External	8	0.045	12		6.21	27					Total days to erect 6 shell courses	135.82	84.85	117.82	90.64	66.85	43.26	21.21	Lesser time for shell erection
			Internal	7		12		5.43						Total man days for shell	11,001.60	5,600.23	7894.09	4,849.14	3,476.30	55.96	37.93	

Notes :
(A) Actual working days considered without holidays.
(B) Data on number of workmen and required working days are acquired from actual jobsites and may vary from one jobsite to another.
(C) Time required for weld repairs not included.
(D) SMAW process considered for vertical joints.