

HJK CONSULTING ENGINEERS

Project Management – Technology – Operating – Consulting Excellence



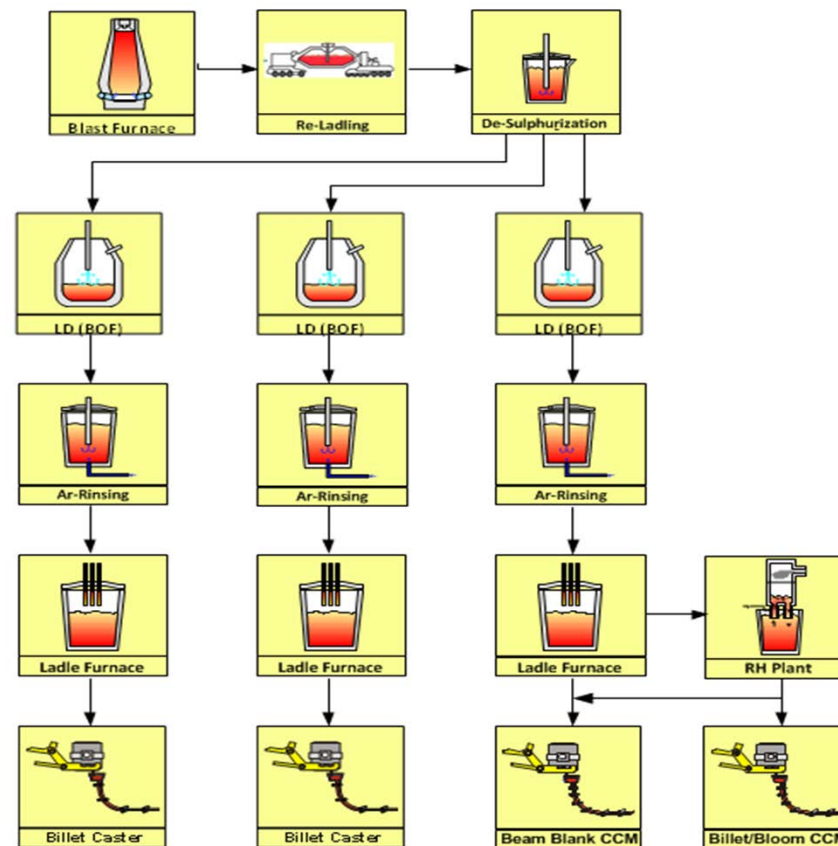
References (Excerpt)

3 x 160/180 ton BOF Steelmaking Plant

Commissioning Management for Primetals Technologies & SAIL Bhilai Steel Plant

Hot Start Up: Converter #01: 31MAR18, Converter #02: 27NOV18, Converter #03: 02FEB20

2017 - 2020

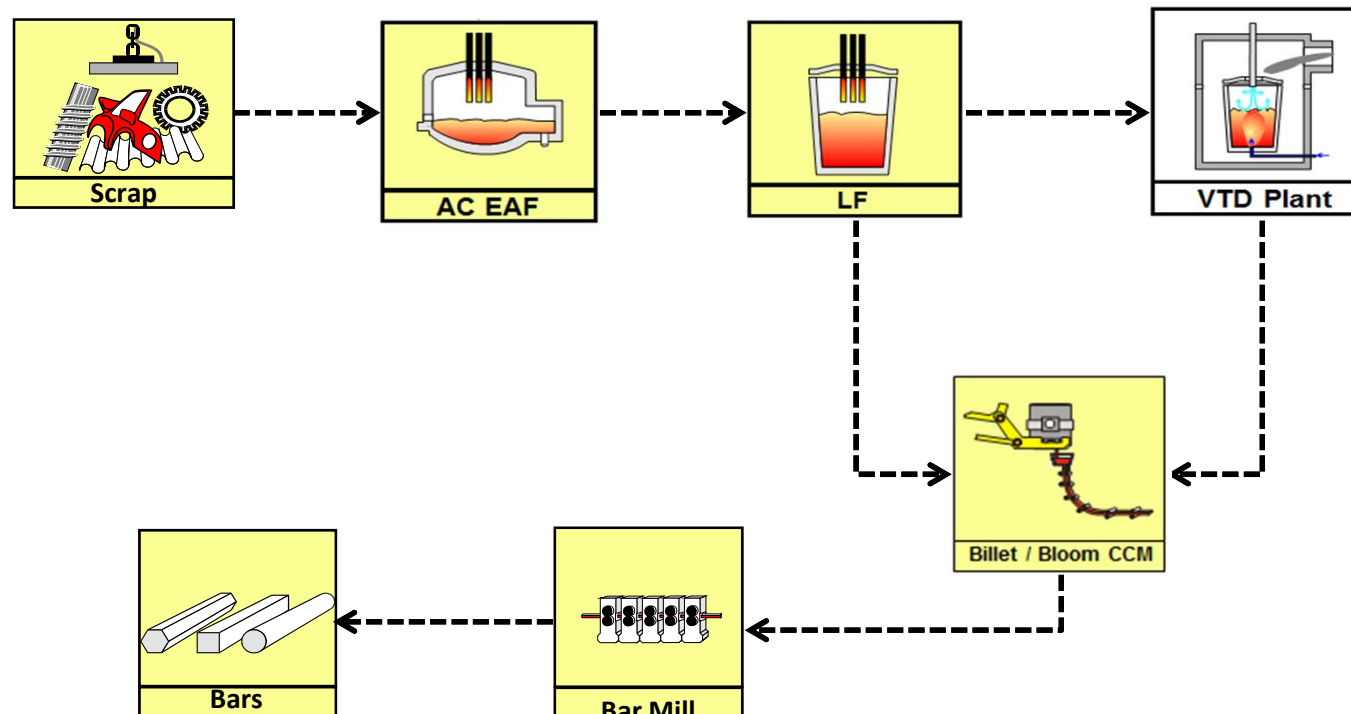


References (excerpt)

VTD Plant Project Implementation

2017 - 2019

Consulting (Feasibility Study, RFP documentation and Bid evaluation) for implementation of VTD plant and Steel Making Plant Automation System Level II, Sweden

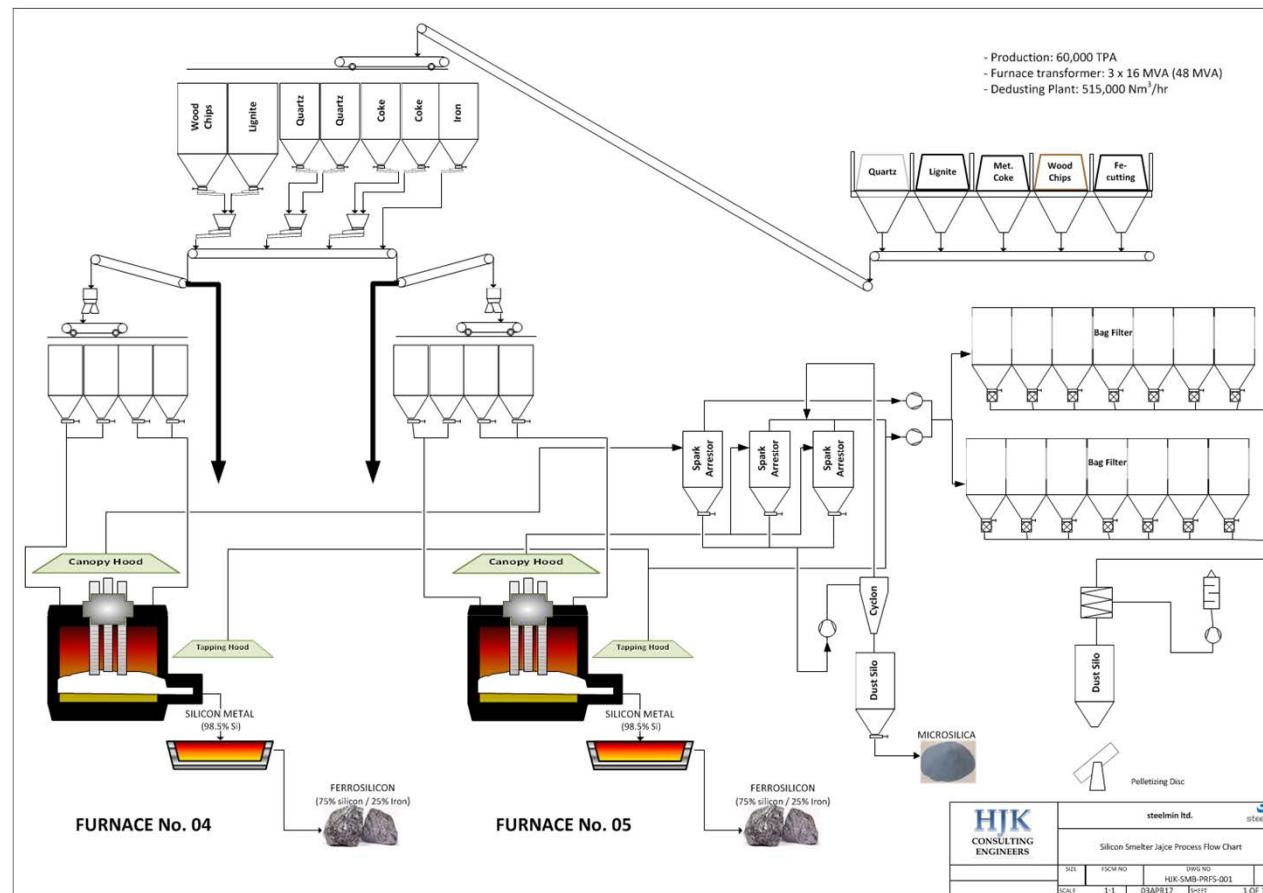


References (excerpt)

Due Diligence Silicon / FeSi Smelter

2017

Due diligence on a silicon smelter in Bosnia-Herzegovina for an Austrian/Australian investment company



References (excerpt)

Consultant Senior Commissioning Manager

2015 - 2016

Primetals Technologies GmbH, Austria / Saudi VOEST ALPINE GmbH, Saudi Arabia

Project Management and Technical Advisory Services for Cold & Hot Commissioning of HADEED Saudi Iron & Steel Company Material Handling System & Dedusting System EAF #1 - #3 turnaround project



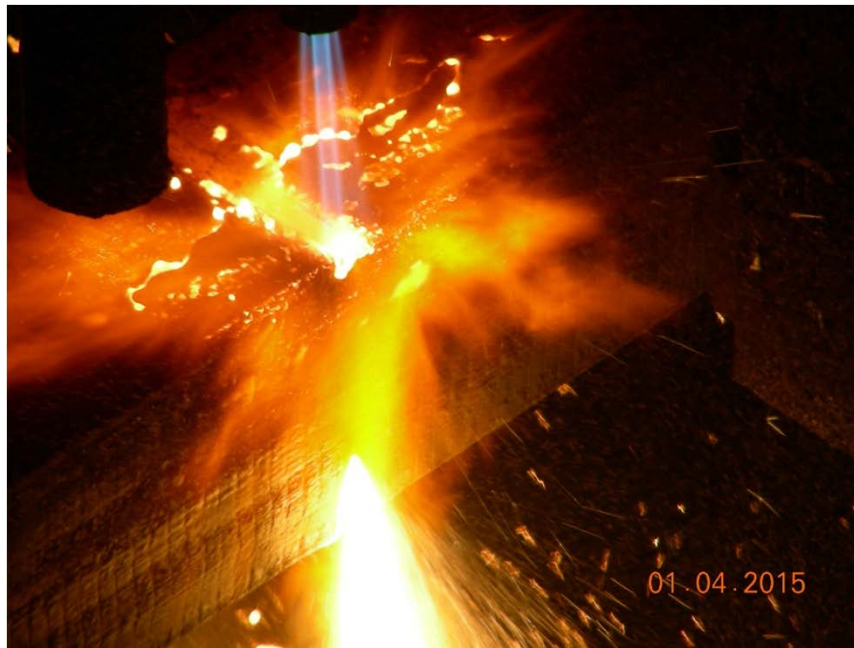
References (excerpt)

2015

Consultant Project Management & Technologies

Commissioning Advisory, 6 Strand Billet/Bloom CCM, Ovako Bar AB, Sweden

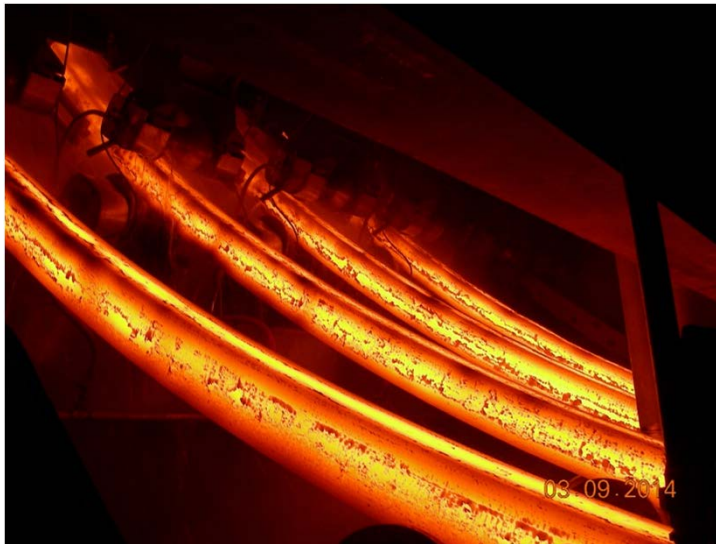
Sq 145x145 – 200x200; rd 150 – 230 mm



References prior Company founding, (excerpt)

Consultant Project Management & Technologies / Senior Project Manager
Commissioning Advisory, 6 Strand Billet/Bloom CCM, Ovako Bar AB, Sweden
Sq 145x145 – 200x200; rd 150 – 230 mm

JUL14 – DEC14

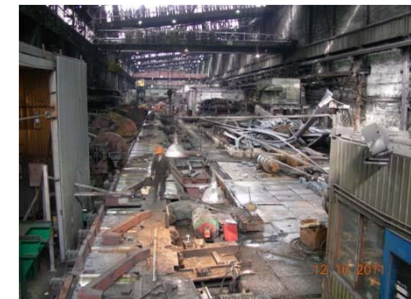
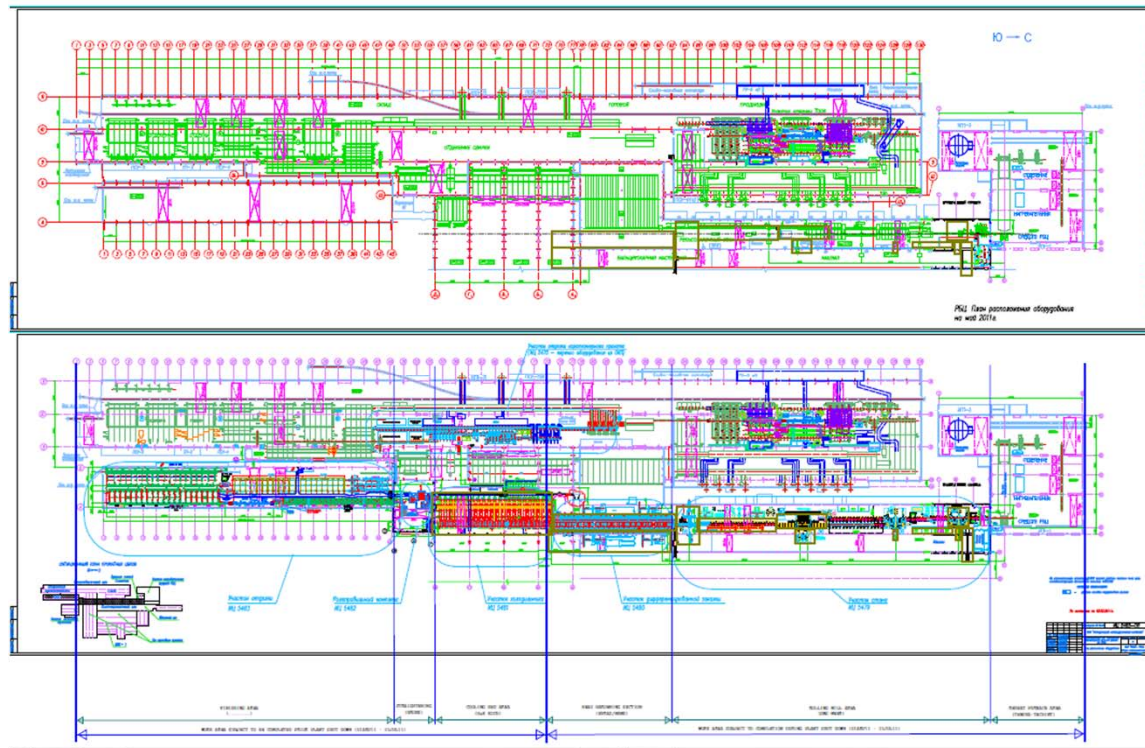


References prior Company founding, (excerpt)

Consultant Project Management & Technologies / Senior Project Manager

2011 - 2012

High-Speed Rail Rolling Mill Turnaround/shut down program (1.3 mTPA, 400 kTPA 100 mtr rails), EVRAZ, Novokuznetsk, Russian Federation



References prior Company founding, (excerpt)

PROJECTMANAGER

APR07-AUG11

AHMSA Steel Melt Shop Expansion Project, 1,200,000 TPA
(150 ton EAF – HM/HBI/Scrap feed, TWIN LF, 01 Strand Slab Caster [1500-2500/153-203 mm]), Monclova,
Mexico



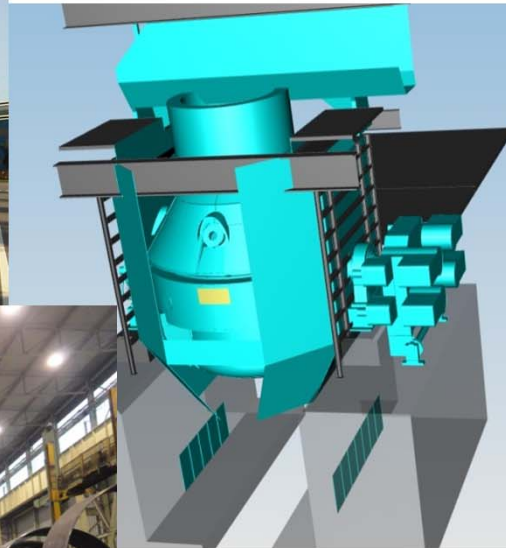
References prior Company founding, (excerpt)

SENIOR PROJECT MANAGER

FEB10 - AUG11

CSN - Companhia Siderúrgica Nacional , 5,650,000 TPA

(2 x 240 ton BOF Converter A & C; Vessel and Trunion Ring replacement, Volta Redonda, Brazil)



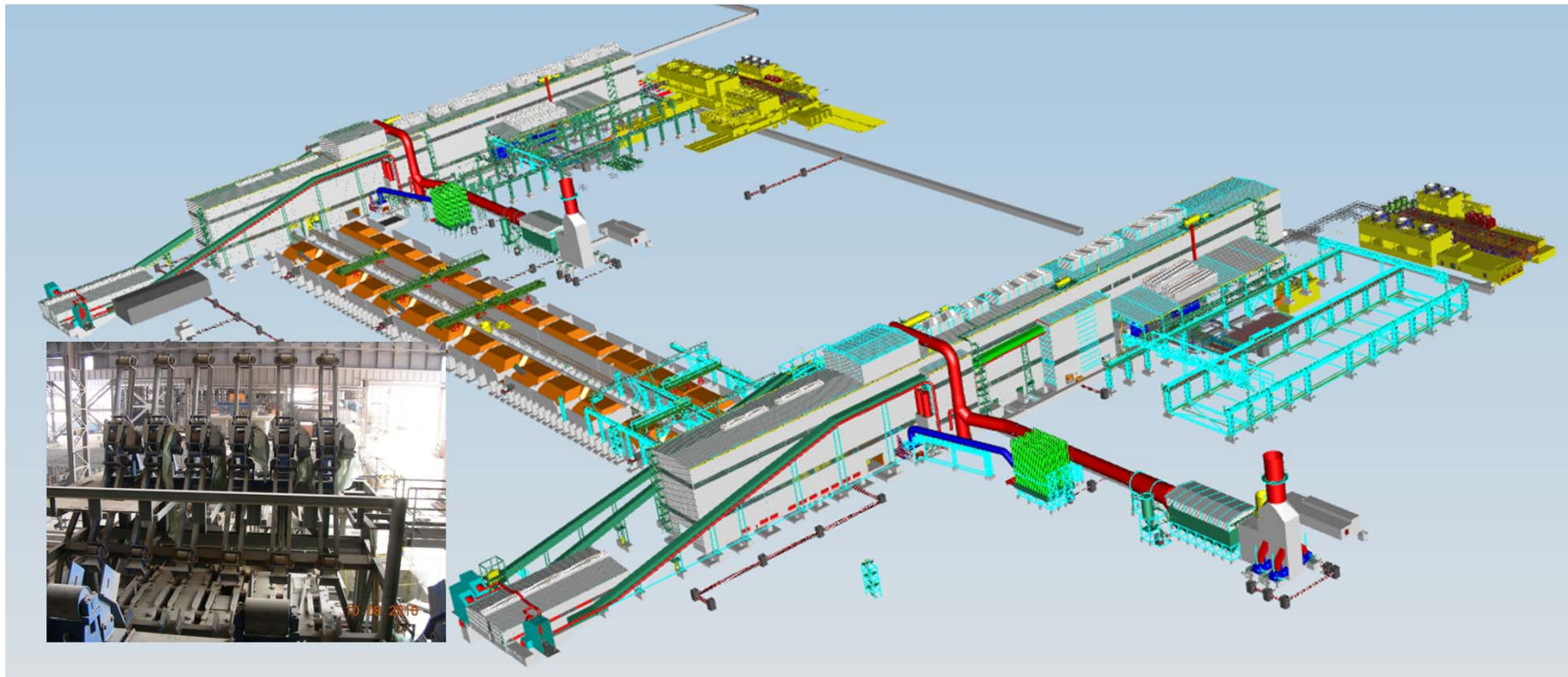
References prior Company founding, (excerpt)

PROJECTMANAGER

MAY10 – AUG11

ESISCO I & II Billet Caster Project, 2 x 1,300,000 TPA

2x 160 ton EAF, 2x160 ton LF, 2 x 6-Strand Billet Caster (80% Scrap and 20% Cold Direct Reduced Iron Or 100% Scrap Charge) , Sadat City, Egypt



References prior Company founding, (excerpt)

SENIOR PROJECT AND COMMISSIONING MANAGER

MAY08 - AUG11

VISCO, Vian Steel Complex Project; 450000 TPA – Iran's largest private steel making company
(70 ton EAF, LF, 04 Strand Billet Caster), Hamedan, Iran

Commissioning Period up to successful First Heat: 08JAN09 – 03MAR09



References prior Company founding, (excerpt)

SENIOR PROJECT AND COMMISSIONING MANAGER

MAY08 - AUG11

VISCO, Vian Steel Complex Project; 450000 TPA – Iran's largest private steel making company
(70 ton EAF, LF, 04 Strand Billet Caster), Hamedan, Iran

EAF Heat Report

70 ton
60 MVA
Liquid Steel: 560,000 ton p.a. based on 100% scrap

TTT 54 (76) min
Hot Heat 8 ton
Liquid Steel: 405,000 ton p.a. based on 86% DR and 15% scrap

Heat No.	TTT (min.)	Scrap (ton)	L. Steel (ton)	YIELD	Temp. (DEG C)	STEEL GRADE	Energy (kWh/ton)	Remarks
02-Mar-09	412.10	76.0	76.0	92.1%	1759.0	GR40	760.729	18 HEAT
2	415.90	81.0	72.6	89.6%	1692.0	GR40	607.011	
08-Mar-09	84.20	331.70	72.48	11.43	43.55	0.00	40.72	
3	191.40	78.0	119.2	152.8%	0.0	GR40	435.243	
01-Apr-09	90.80	100.68	37.73	6.50	24.75	0.00	20.36	
4	446.15	77.0	69.0	88.3%	1680.0	S137.2	676.279	
08-Aug-09	82.70	363.48	41.72	7.66	0.13	S137.2	36.6	
5	279.77	71.0	73.8	103.9%	1540.6	S137.2	781.000	HEAT START

LF Heat Report

70 ton
12 MVA
Liquid Steel: 560,000 ton p.a. based on 100% scrap

TTT 54 (76) min
Hot Heat 8 ton
Liquid Steel: 405,000 ton p.a. based on 86% DR and 15% scrap

Heat No.	TTT (min.)	Scrap (ton)	L. Steel (ton)	YIELD	Temp. (DEG C)	STEEL GRADE	Energy (kWh/ton)	Remarks
02-Mar-09	113.00	79.0	1.0	GR40	14.286			
2	167.17	73.0	1.611.7	GR40	91.781			
08-Mar-09	44.70	0.00	0.00	25.21	0.00	0.00		
3	93.62	74.5	1.609.8	GR40	13.960			
01-Apr-09	12.20	0.00	0.00	30.75	0.00	0.00		
4	144.32	74.3	1.620.4	S137.2	33.244			
08-Aug-09	31.90	112.10	0.00	38.30	0.00	0.00		

CCM Casting Report

Strands 03 plus 01
Billet Size 100x100 to 160x160 mm
Billet Length 6-12 mtr

Billets based on 100%

Cast No.	Casting Time (min.)	Steel Temp (DEG C)	GRADE	Tundish Temp (DEG C)	Billets no/cast	Billets (ton/cast)
64	48.00	1588.0	S15SP	1536.8	43	57.6
21-Sep-09	No	Yes	450	21.0	52.0	44.0
65	49.00	1517.0	S15SP	1538.0	45	60.3
22-Sep-09	No	Yes	3.0	49.0	59.0	57.0
66	61.00	1604.0	S15SP	1541.2	49	65.7
22-Sep-09	No	Yes	65.0	66.0	80.0	
67	58.00	1610.0	S15SP	1546.0	45	50.3
23-Sep-09	No	Yes	60.0	62.0	53.0	
68	56.00	1510.0	S15SP	1543.2	52	69.8

PERFORMANCE DATA "EAF"

70 ton
60 MVA
Liquid Steel: 560,000 ton p.a. based on 100% scrap

TTT 54 (76) min
Hot Heat 8 ton
Liquid Steel: 405,000 ton p.a. based on 86% DR and 15% scrap

Date	GRADE	Heat No.	TTT (min)	Scrap (ton)	L. Steel (ton)	P-ON (min)	DELAYS (min)	YIELD	ENERGY (kWh/ton)	O2 (m3/ton)	Si (m3/ton)	C (kg/ton)	C-Char. (kg/ton)	Line (kg/ton)
15-Aug-09	S137.2	7	88.5	72.0	70.2	68.9	16.6	97.5%	531.7	45.3	8.3	16.0	12.8	34.2
01-Apr-09	GR40	3	93.8	74.5	12.2	14.0	0.4	0.0	0.0	0.0	0.0	0.8	0.0	
08-Aug-09	S137.2	4	144.3	74.3	31.9	33.2	0.5	0.0	0.0	0.0	0.0	3.8	0.0	

15-Aug-09		S137.2		7	88.5	72.0	70.2	68.9	16.6	97.5%	531.7	45.3	8.3	16.0	12.8	34.2
01-Apr-09		GR40		3	93.8	74.5	12.2	14.0	0.4	0.0	0.0	0.0	0.0	0.8	0.0	0.0
08-Aug-09		S137.2		4	144.3	74.3	31.9	33.2	0.5	0.0	0.0	0.0	0.0	3.8	0.0	0.0

TTT 54 (76) min
Hot Heat 8 ton
Based on 86% DR and 15% scrap

B	B1	C1				Remarks
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

70 ton
12 MVA

Liquid Steel: 560,000 ton p.a. based on 100% scrap

PERFORMANCE DATA "LF"

Heating Rate 4 DEG C/min

405,000 ton p.a. based on 86% DR and 15% scrap

0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

		maxim. Time (min)														Liqu. Steel (ton)														Power ON (min)														ENERGY (kWh/ton)														H2 (m3/ton)														AR (m3/ton)														C (kg/ton)														Line (kg/ton)														D Line (kg/ton)																											
[15-Aug-09] [S137.2] [340]		113.0														70.0														0.0														14.3														0.0														0.0														0.0														0.0														0.0														0.0													
[01-Apr-09] [GR40] [340]		157.2														73.0														44.7														91.8														0.4														0.0														0.0														0.0														9.1														0.0													
01-Apr-09 [GR40]		3		93.8														74.5														12.2														14.0														0.4														0.0														0.0														0.8														0.0																									
08-Aug-09 [S137.2]		4		144.3														74.3														31.9														33.2														0.5														0.0														0.0														3.8														0.0																									

PERFORMANCE DATA "CCM"

70 ton
12 MVA
Liquid Steel: 560,000 ton p.a. based on 100% scrap

TTT 54 (76) min
Hot Heat 8 ton
Liquid Steel: 405,000 ton p.a. based on 86% DR and 15% scrap

Date	GRADE	Heat No.	TTT (min)	Scrap (ton)	L. Steel (ton)	P-ON (min)	DELAYS (min)	YIELD	ENERGY (kWh/ton)	O2 (m3/ton)	Si (m3/ton)	C (kg/ton)	C-Char. (kg/ton)	Line (kg/ton)
15-Aug-09	S137.2	7	88.5	72.0	70.2	68.9	16.6	97.5%	531.7	45.3	8.3	16.0	12.8	34.2
01-Apr-09	GR40	3	93.8	74.5	12.2	14.0	0.4	0.0	0.0	0.0	0.0	0.8	0.0	
08-Aug-09	S137.2	4	144.3	74.3	31.9	33.2	0.5	0.0	0.0	0.0	0.0	3.8	0.0	

References prior Company founding, (excerpt)



PROJECT ASSISTANCE & PROJECT CRISES MANAGEMENT, COLD COMMISSIONING MANAGEMENT

MAY06 - MAR07

HADEED Steel Making Plant Expansion Project, 1.400.000 TPA

(150 ton EAF –World FIRST Hot DRI/Scrap feed, LF, 01 Strand Slab Caster), Al Jubail, Kingdom of Saudi Arabia



References prior Company founding, (excerpt)

SENIOR PROJECT MANAGER:

NGL Extraction Plant Troll Upgrading Project, 143 million standard cubic metres/day
Kollsnes, Norway

2002 - JUL04



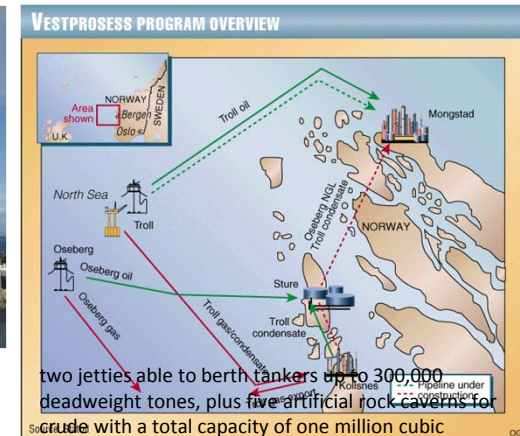
References prior Company founding, (excerpt)

SENIOR PROJECT & COMMISSIONING MANAGER, CRISES & CLAIMMANAGER:

1999 - 2000

Sture Crude Upgrading Project:

Modernizing of an Existing Oil Terminal at Norsk Hydro as, Tjeldsto / Norway



60,000-cubic-metre cavern for liquefied petroleum gases (LPG) and a ballast water cavern of 200,000 cubic metres

Products from the Sture terminal:

- Oseberg Blend – crude oil and condensate from seven platforms
 - LPG mix – blend of propane and butane
 - Naphtha – comprises pentanes and hexanes, used together with crude in refineries
 - Fuel gas – methane and ethane, used for heating in the terminal processes
 - Grane Blend – crude from the Grane platform
- 150-160 crude oil and LPG carriers currently call at Sture every year

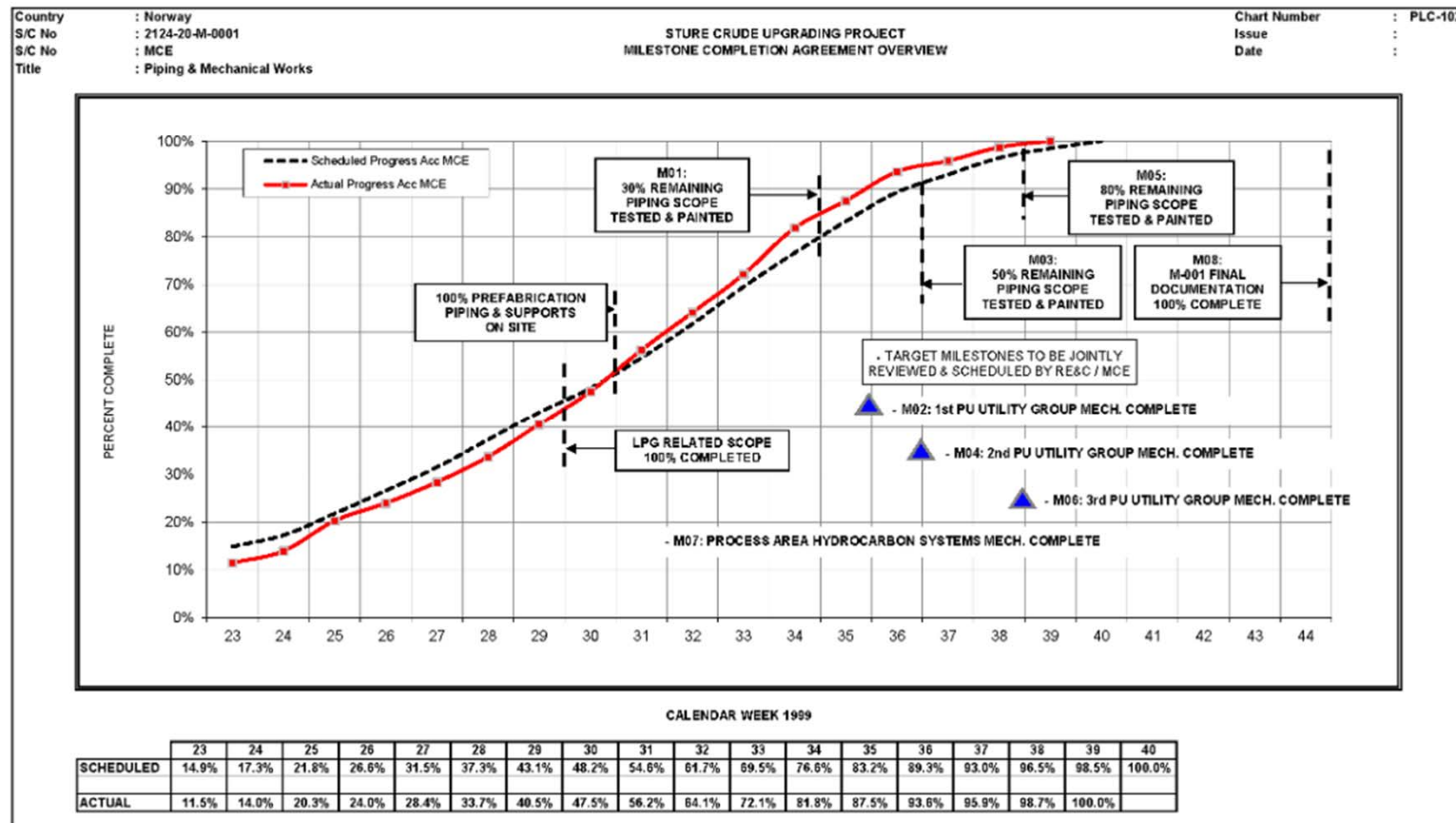
References prior Company founding, (excerpt)

SENIOR PROJECT & COMMISSIONING MANAGER, CRISES & CLAIMMANAGER:

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Sture Crude Upgrading Project:

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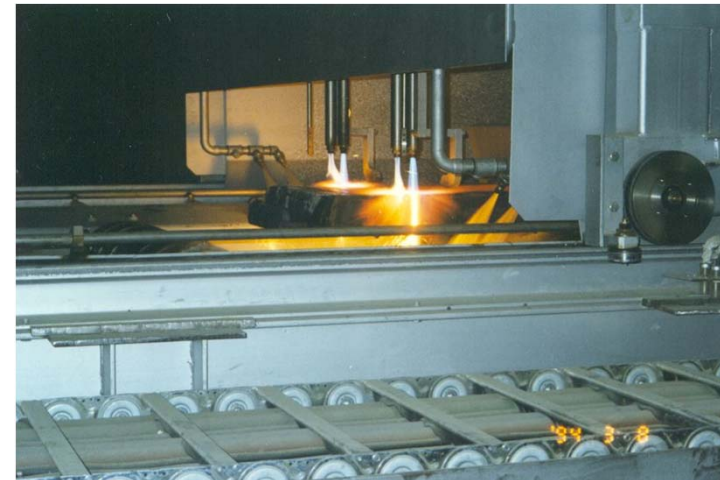
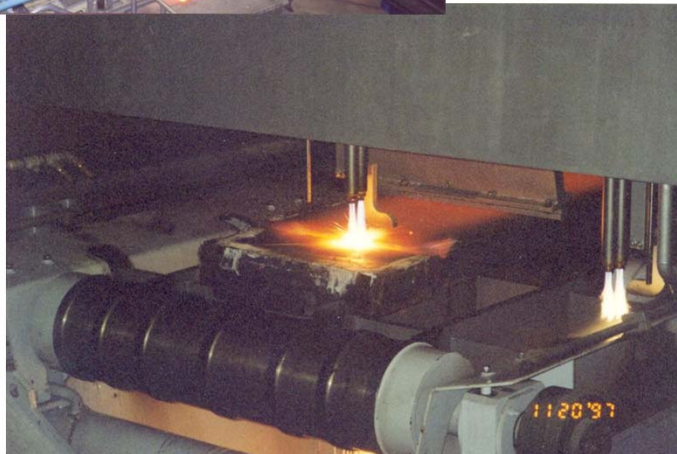
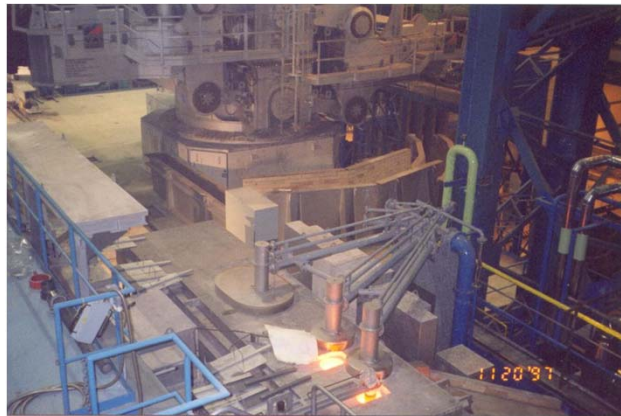
References prior Company founding, (excerpt)

Project / Site & Commissioning Manager:

Nova Hut a.s., Ostrava / Czech Republic; 1.4 mTPA

Installation of one unit Thin Slab Continuous Casting Machine ([740-1575, 150 mm])

1997



References prior Company founding, (excerpt)

General Site Manager & Claim Manager:

1994 - 1996

Revamping & Modernizing of Continuous Pickling Line & Tandem Continuous Mill and Skin-Pass Mill
1,900,000 TPA; w: 600 -1600; thk: 0.3 – 3.0 mm; coil weight ≤30 ton

