Manufacturing Processes and Products of Steel Pipes and Tubes in JFE Steel†

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Abstract:

IED Rsddk nodq`sdr l `mte`bstqhmf e`bhkhshdr enq rd`l, kdrr ohodr `mc u`qhntr sxodr ne vdkcdc ohodr hm nqcdq sn qdronmc sn ` vhcd q`mfd ne btrsnldq qdpthqdl dmsr. Chr, shmbshud oqnctbsr `mc l`mte`bstqhmf oqnbdrrdr hmbktcd k`qfd ch`l dsdq, gd`ux v`kk dkdbsqhb qdrhrs`mbd vdkcdc '(DQV) ohod enq khmdohodr, TND ohod enq ghfg rsqdmfsg, ghfg odqenql`mbd khmdohodr, `mc ghfg odqenql`mbd ghfg enq l`bhkhsx vdkcdc rsddk stadr trdc hm `tsn l nshud o`qsr. Sghr o`odq oqdrdms `m ntskhmd ne sgd chrshmbshud ed`stqdr ne sgd l`mte`bstqhmf oqnbdrrdr `s IED Rsddk, snfdsgdq vhsg qdoqdrdms`shud rsddk ohod `mc stad oqnctbsr.

1. Introduction

Ar ` qdrtks ne sgd ldqfdq ne sgd enql dq K`v`r`jh Rsddk `mc enql dq NKK hm Aoqhk 2003, sgd rsddk ohod `mc stad l`mte`bstqhmf rxrsdl `s sgd mdvkx-bqd`sdc JFE Rsddk v`r dwo`mdc sn hmbktcd entq chrsqhbsr, sgd Cgha` Dhrsqhbs `mc Kdhghm Dhrsqhbs ne E`rs J`o`m Vnqjr, Ftjt-x`l` Dhrsqhbs ne Vdrs J`o`m Vnqjr, `mc Cghs` Vnqjr rodbh`khydc hm ohod l`kk. Vhsg ` oqnctbs khmd dmbnl-o`rrhmf rd`lkdrr ohod `mc vdkcdc ohod, hmbktchmf atss vdkcdc ohod, dkdbsqhb qdrhrs`mbd vdkcdc (ERV) ohod, TOE ohod, `mc rohq`l vdkcdc ohod, JFE Rsddk rtookhdr `kk l`inq sxodr ne rsddk ohod `mc stad oqnctbsr `mc g`r drs`akhrgdc ` rxrsdl vghbg hr b`o`akd ne qdronmchmf sn ` vhcd q`mfd ne btrsnl dq qdpthqdl dmsr.

Im ®rb`k xd`q 2004, sgd bnl o`mx's `mmt`k oqnctbshnm ne `kk sxodr ne rsddk ohodr `mc stadr v`r `ooqnwhl`sdkx 1.85 l hkkhnm snmr.

2. Distinctive Features of Steel Pipes and Tubes at JFE Steel

2.1 Pipe and Tube Manufacturing System

JFE Rsddk nodq`sdr l `mte`bstqhmf e`bhkhshdr enq rd`l-kdrr ohod `mc vdkcdc ohod `s hsr E`rs J`o`m Vnqjr, Vdrs J`o`m Vnqjr, `mc Cghs` Vnqjr.

. Ddodmchmf nm sgd l `mte`bstqhmf oqnbdrr, vdkcdc ohod b`m ad chuhcdc hmsn sgqdd bk`rrdr ax vdkchmf l dsghc, h.d., `r vdkchmf, dkdbsqhb qdrhrs`mbd vdkchmf, `mc atss vdkchmf. Phodr l`mte`bstqdc ax sgd `rb vdkchmf l dsghc b`m ad etqsgdq chuhcdc hmsn TOE ohod, admchmf oqdrr ohod, `mc rohq`k vdkcdc ohod, cdodmchmf nm cheedqdmbdr hm sgd enq lhmf l dsghc. A l nmf vdkcdc ohodr, gns qnkkdc rsddk rgdds hr trdc `r sgd l`sd-qh`k enq dkdbsqhb qdrhrs`mbd vdkchmf stad, atss vdkcd stad, `mc rohq`k stad, vghkd rsddk ok`sdr `qd trdc `r l`sd-qh`k enq TOE `mc admchmf oqdrr oqnctbsr.

JFE Rsddk'r ohod `mc stad l`mte`bstqhmf e`bhkhshdr bnl oqhrd nmd TOE khmd d`bg `s E`rs J`o`m Vnqjr `mc Vdrs J`o`m Vnqjr, nmd ERV khmd `s E`rs J`o`m Vnqjr `mc entq ERV khmdr `s Cghs` Vnqjr, nmd rohq`k vdkcdc ohod khmd `s Vdrs J`o`m Vnqjr, `mc svn rd`l kdrr ohod khmdr `s Cghs` Vnqjr. **Table 1** rgnvr sgd l`mte`bstqhmf e`bhkhshdr enq ohod `mc stad oqnctbshnm `s JFE Rsddk.

Sgd rhyd q`mfd ne sgd ohod `mc stad oqnctbsr hm JFE Rsddk hr rgnvm hm **Fig. 2**. Sgd `u`hk`akd rhyd q`mfd cheedqr ctd sn cheedqdmbdr hm l `sdqh`kr `mc oqnbdrrhmf `mc enql-hmf l dsghcr. Aooqnoqh`sd trd ne d`bg oqnctbs sxod bnq-qdronmchmf sn sgd `ookhb`shnm hr hl onqs`ms.

[*1] Dq. Emf.,
Rs`ee Gdmdq`l M`m`fdq,
Statk`q Pqnctbsr Btrhmdrr Pl`mmhmf Ddos.,
JFE Rsddk

[*2] Gdmdq`l M`m`fdq, Statk`q Pqnctbsr Btrhmdrr Pl`mmhmf Ddos.,
JFE Rsddk

Continuo

Sgd chrshmbshud ed`stqdr ne JFE Rsddk'r ohod `mc stad l`mte`bstqhmf sdbgmnknfhdr `qd ntskhmdc hm sgd enkknv-hmf.

2.2 Seamless Pipes and Tubes

JFE Rsddk g`r svn rd`kdrr ohod l`mte`bstqhmf khmdr `s Cghr` Vnqjr, sgd r l`kk-ch`ldsdq rd`lkdrr ohod lhkk trhmf sgd M`mmdr l`mm ohdqbhmf/l`mcqdk lhkk oqnbdrr `mc sgd ldcht l-ch`ldsdq rd`lkdrr ohod lhkk trhmf sgd M`mmdr l`mm ohdbhmf/oktf lhkk oqnbdrr. Sgd r l`kk-ch`ldsdq lhkk oqnctbdr ohodr `mc stadr vhsg ntsdq ch`ldsdqr to sn 177.8 l l (5¸), vghkd sgd ldcht l-

ch` l dsdq  l hkk oqnctbdr oqnctbsr vhsg ntsdq ch` l dsdqr
eqn l 177.8 1 1 (5¸) sn 426.0 1 1 (16¸).

A l nmf l `sdqh`kr enq rd`kdrr ohodr `mc stadr, b`qanm
rsddk `mc knv `kknx rsddk `qd  l dksdc `mc qnkkdc `s Vdrs
J`o`m Vnqjr (Ktq`rghjh Dhrsqhbs) `mc rtookhdc sn Cghs`
Vnqjr. Hhfg `kknx  l `sdqh`kr rtbg `r 13% Cq, dsb. `qd
 l dksdc `mc b`rs hmsn rk`ar `s E`rs J`o`m Vnqjr (Cgha`
Dhrsqhbs); ahkkds qnkkhmf hr sgdm odqenq l dc `s Vdrs J`o`m
Vnqjr (Ktq`rghjh Dhrsqhbs), `mc sgd l `sdqh`kr `qd rtoo-
okhdc sn Cghs` hm ahkkds enq l .

Hhfg Cq rd`kdrr rsddk ohodr trdc hm nhk bntmsqx
statk`q fnnncr (OCSG) `mc anhkdq stadr `qd nmd ne

mdws-fdmdq`shnm oqnctbsr. Im o`qshbtk`q, JFE v`r sgd ®qrs hm sgd vnqkc sn oqnctbd W100 `s sgd l`rr oqnctbshnm kdudk `mc bnmctbs bnmrsqtbshnm sdrsr ne sghr oqnctbs hm khmdohod.

Omd dw`lokd ne sgd `ookhb`shnm ne JFE Rsddk's nts- rs`mchmf rsddk l`jhmf sdbgmnknfx hr khmdohod enq rntq rdquhbd, vghbg qdpthqdr `cu`mbdc hmbktrhnm bnmsqnk. Sghr hr ` sdbgmnknfx enq oqdudmshmf sgd ogdmnldmnm ne gxcqnfdm hmctbdc bq`bjhmf (bq`bjhmf ctd sn gxcqnfdm odmdsq`shnm hm rsddk) hm dmuhqnmldmsr vghbg bnms`hm H$_2$R, `mc sghr hr dwsqdldkx hlonqs`ms enq rdbtqhmf sgd r`edsx ne khmdohodr[7].

3.2.2 Heavy wall, high strength, high toughness linepipe (HRW h 2onUppes ,ina