

cpf"vqngtcpegu"ctg" fkhgtgpn"htq o"vjqug"ht"ektewnctkv{"kp"
LCUU8."kp" y jkej"vjg"rtqkukqpu"eqpukfgt"vjg"nkpget" o ku
cnki p o gpv" y jkej"qeewtu"kp" y gnfu"cv"rkrq"lqkpvu0

Vjku" fkhgtgpeg" dgeq o gu" rctkewnctn{"nctig"kp"nctig/
fkc o gvg" rkrqu0" Hqt" gzc o rng." kp" LKU." vjg"vqngtcpeg"ht"
φ 4"222" o o" ku" 032" o o" d{" eqpxgtukqp" qh" vjg" qwvgt"

LCUU8." vjg"vqngtcpeg"ku" 05" o o" urgekLgf"cu"ektewnctkv{0"
Vjwu."kp"dwnfkpi"htc o gu."eqpukfgtcvkqp"qh"LCUU8." y jkej"
tgsuktgu"tgncvkggn{"uvtkev"ceewtce{"eqpvtn."ku"fg o c p f g f 0

2.4 Development Targets

Vjg"qdlgev"qh"vjku"fgxgnqr o gpv" y cu"tqwpf"uvgn"rkrqu"

ujqyp"kp"Hki0"5*c+0"Kp"jki jgt"uvtgpi vj"uvggnu."nqy" [T"qh"
:2 ' "qt"nguu"ecp"dg"cejkgxgf"ykvj"7;2"Pl o o
*UC662+."cpf":7 ' "qt"nguu"ecp"dg"cejkgxgf"9:2"Pl o o
encuu"uvgggn"*nqy" [T/J V9:2=LHG/JKVG P9:2V+"d{"cr rn{

kpenwfgu"kpvg/etkvecn"tgjgcvgf"swgpejkpi"*Sø+."cu"ujqyp"
kp" Hki0"5*d+0" LHG" Uvggn" jcu" qdvckpgf" egtvkLecvkqp" htq o "
vjg"Okpkuvgt"qh"Ncpf."Kphtcuvtwevtg"cpf"Vtcpurqtv"hqt"kvu"
nqy" [T"uvgggn"nkpgwr" ykvj"vgpukng" uvtgpi vju"kp"vjg"tcpig"

Tgegpvn{." LHG" Uvggn" guvcdnkujgf" cp" qp/nkpg" jgcvt
vtgcvo gpv"vgejppnqi {"vjcv"tgcnk|gu"Łpg"fkurgtugf" o ketq
uvtwevtcn" eqpvtqn"qh"vjg"jctf" octvgpukvg" rjcug." yjkej"

f"c _ utkeqwnf"qpnc"dg"cejkgxgf"ykvj"vjg"n"k ng"u# gu b

Table 2 Results of y-groove weld cracking tests

Uvggn" rncvg		Ygnfkpi "eqpfkvpku		

qtfgt"vq"ucvkuh{" vjg"nqy" [T"urgekŁecvkqp" hqt"uvgn" rkrqu." vjg"vctigv" [T"qh" vjg" rncvg" wugf"cu" vjg"dcug" o cvgtkn"ku" fgetgcugf" hwtvjgt." qt" c" rtqegu" yjkej" tgfwegu" yqtm" jctfgpkpi"ku" cr rnkf." uwej"cu" ycto" dgpfkpi" hqt okpi"qt" jgcv"vtgcvo gpv"chvgt" rkr go cmkpi."cu" fguetkdgf"kp"Ugevkqp"

Hkiwtg"6*d+" ujqyu" vjg" ghhev" qh" vjg" coqwpv" qh" rtg uvtckp" qp" vjg" Ejctr{" htcewtg" vtcukvkqp" vgo rgtcvwtg" *xVtu+0" Cmm" qh" vjg"uvgn" rncvgu" ujqygf" go dtkvng o gpv"cu" c" tguwnv"qh" uvtckp" cikpi."cpf" xVtu" kpetgcugf" d{" 52672ÅE0" Vjwu." ykvj" jgcx{" "uvgn" rncvgu" yjkej" ctg"vq" dg" cr rnkf"cu" o cvgtkn" hqt" rkr go cmkpi."kv"ku" pgeguuct{" "vq" qrvk o k|g" vjg"

ukfgtkpi" vjg" tgfwevkqp" qh" vqwi jpguu" ecwugf" d{" dgpfkpi"

3.1.3 Weldability (Lowering P_{CM})

LHG" Uvggn" jcu" fgxgnqrgf" jki j" uvtgpi vj." jki j" rgt hqt o cpeg"uvgn" rncvgu" yjkej" ugewtg" gzegngpv" ygnfcdknkv{" d{" tgfwekpi" vjg" ectdqp" gswkxcngpv" C_{gs}" cpf" ygnf" etcem" ugpukvkvkv{" eqo rqukvkp" P_{EO}" wukpi" jki j" ceewtce{" VOER." vcmkpi" cfxcpvcig" qh" kvu" cfxcpvgf" ceegnctcvf" eqqkpi" fgxkeg." vjg" Super/QNCE0" Cu" cp" gzc o rng." **Table 2** ujqyu" vjg" tguwnvu" qh" { / i tqxg" ygnf" etcem" vguvu" qh" vjg" o ckp" nqy" [T" uvgn" rncvgu" hqt" dwknfkpi" eqpuvtwevkqp" *772" Plo o encuu" uvgn" *JDN5: 7+." jki j" ygnfcdknkv{" v{ rg" 7; 2" Plo o uvgn" *UC662/W+7+ "cpf" nqy" [T/9: 2" Plo o "encuu" uvgn+0" Ykvj" uvgn" ykvj" wpfgt" 7; 2" Plo o " nqy." vjg" rtgjcvkpi" vgo rgtcvwtg" hqt" rtgxgpvki" etcemkpi" kp" EQ cte" ygnfkpi" ycu" tqqo" vgo rgtcvwtg" qt" nqygt." ujqykpi" vjcv" vjgug" uvgnu" rquuguu" ygnfcdknkv{" qh" c" ngxgn" cv" yjkej" rtgjcvkpi" ku" igpgtcmm{" wppgeguuct{0

3.2 Pipemaking

3.2.1 Bending forming

rtqfwegf" d{" LHG" Uvggn." ykvj" jki j" uvtgpi vj." jgcx{" ycm" vjkempguu" rtqfwevu" uwej" cu" vjqug" yjkej" ygtg" vjg" qdlgev" qh" vjku" fgxgnqro gpv." rkr go cmkpi" ku" rgthqto gf" d{" vjg"

rtguu" dgpf" o gvjqf" *Photo 2+0" Kp" vjg" rtguu" dgpf" o gvjqf."

kpi" cv" gswcn" kpvtxcnu" ykvj" c" rtguu" ocejkgp." cpf" vjg" tgswtg" ewtvcvwtg" ku" vjgp" qdvckpgf" wukpi" c" uvtcki jvgpgt0" Vjg" tguvtkevqp" qp" vjku" o gvjqf" ku" vjg" ecrcekv{" qh" vjg" rtguu0" Jki j" rtguu" rqygt" ku" pgeguuct{" kp" rncuvke" dgpfkpi" hqt okpi" vj tqwi j" vjg" hwnn" vjkempguu" qh" jgcx{" icwi g" uvgn" rncvgu0" Kp" ecugu" yjkej" gzeggf" vjg" ecrcekv{" qh" vjg" rtguu" ocejkgp." kv" ku" pgeguuct{" vq" rgthqto" ycto" hqt okpi" d{"

kpetgcugu." dwv" yqtm" jctfgpkpi" cnuq" ejcpi gu0" Vjgtghqtg." kv" ku" pgeguuct{" vq" fgvt okpg" vjg" rtguu" dgpf" eqpfkvpku"

Hwtvjgt o qtg." kp" qtfgt" vq" ugewtg" fko gpukqpcn" ceewtce{" chvgt" rkr go cmkpi." eqpvtqn" qh" vjg" fko gpukqpcn" ceewtce{" qh" vjg" o cvgtkn" rncvg." c" itcur" qh" vjg" rtguu" ecrcekv{" cpf"

d{" ugc o" ygnfkpi." dgeq o g" kuuwgu0" Rctkewnctn{" kp" jgcx{/ ycmgf" rkrqu." fwg" vq" vjg" nctig" coqwpv" qh" ygnfkpi" cpf" ykfg" ykfvj" qh" vjg" ugc o" dgcf." ygnfkpi" eqpfkvpku" uwej" cu" i tqxg" uk|g" cpf" ygnfkpi" jgcv" kprwv" fwtkpi" ygnfkpi" ctg" eqpvtqmgf" htqo" vjg" xkgy rkp" qh" ugewtkpi" fko gpukqpcn" ceewtce{0

kttgur gevkg"qh"uvtgpi vj."vj kempguu."qt"ewtxcwtg0

Figure 6" uj qyu" vjg" fkutkdwkqp" qh" vjg" {kgnf" tcvkq"
* [T+" qh" vjg" rkr gu" d{" t D