

API Standards for Pipe Inspections

Hilton Prejean



September 11, 2012

AADE-Denver

API Standards for Pipe Inspections

New Drill Stem Elements

5DP

Specification for Drill Pipe

ANSI/API SPECIFICATION 5DP
FIRST EDITION, AUGUST 2009

EFFECTIVE DATE: AUGUST 1, 2010

CONTAINS API MONOGRAM ANNEX AS PART OF U.S.
NATIONAL ADOPTION

ISO 11961:2008 (Identical), Petroleum and natural gas
industries—Steel drill pipe



15th

Spec 7-1

Specification for Rotary Drill Stem Elements

ANSI/API SPECIFICATION 7-1
FIRST EDITION, MARCH 2006

EFFECTIVE DATE: SEPTEMBER 2006

ISO 10424-1:2004 (Modified), Petroleum and natural gas
industries—Rotary drilling equipment—Part 1: Rotary
drill stem elements



40th

Spec 7-2

Specification for Threading and Gauging of Rotary Shouldered Thread Connections

ANSI/API SPECIFICATION 7-2 (FORMERLY IN SPEC 7)
FIRST EDITION, JUNE 2008

EFFECTIVE DATE: DECEMBER 1, 2008

CONTAINS API MONOGRAM ANNEX AS PART OF
US NATIONAL ADOPTION

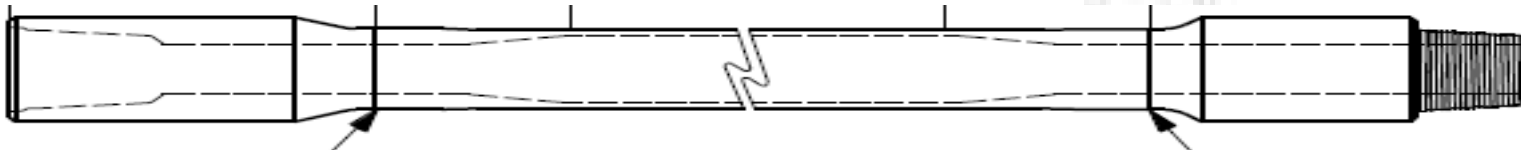
ISO 10424-2: 2007 (Identical), Petroleum and natural gas
industries—Rotary drilling equipment—Part 2:
Threading and gauging of rotary shouldered thread
connection



API Standards for Pipe Inspections

New Drill Stem Elements

- Spec 5DP Drill Pipe



Making Drill Pipe

three Product Specification Levels (PSL1, PSL2, PSL3)

PSL1 is same as previous E, X, G and S

PSL2 more stringent requirements *Annex G / Table G.1*

PSL3 additional requirements (*non NDT*) *Annex G / Table G.1*

API Standards for Pipe Inspections

New Drill Stem Elements

Wall Thickness

5" 19.50#

.362" = 100% nominal

.317" = 87.5% new

.290" = 80% used

.253" = 70%

95% RW spec .344"
will Extend Life of pipe

Drill Pipe API 5DP NDT - Tube Body		PSL 2 is in addition to PSL 1	PSL 3 is in addition to PSL 1 and PSL 2		
Grade	PSL 1	PSL 2	PSL 3	Tool Joint	Weld Zone
E	Visual NDT 12.5% notches - ID/OD Long / Trans UT or EMI / combination Wall	NDT 5% notches - ID/OD Long / Trans UT or EMI / combination SR 15		Visual NDT after Heat Treat surfaces ID/OD orientation Long / Tran Wet Fluorescent MPI Dimensional tool joint OD/ID length OD Pin/Box	Visual Wet Fluorescent MPI 1/16" vertical through hole UT - 45° x 2.25mhz Dimensional OD / ID Straightness End Drift
E to SR 2	NDT 5% ID/OD Long / Trans UT or EMI / combination Wall				
X	Visual NDT 12.5% notches - ID/OD Long / Trans UT or EMI / combination Wall	NDT 5% notches - ID/OD Long / Trans UT or EMI / combination SR 15		Visual NDT after Heat Treat surfaces ID/OD orientation Long / Tran Wet Fluorescent MPI Dimensional tool joint OD/ID length OD Pin/Box	Visual Wet Fluorescent MPI 1/16" vertical through hole UT - 45° x 2.25mhz Dimensional OD / ID Straightness End Drift
X to SR 2	NDT 5% ID/OD Long / Trans UT or EMI / combination Wall				
G	Visual NDT 12.5% notches - ID/OD Long / Trans UT or EMI / combination Wall	NDT 5% notches - ID/OD Long / Trans UT or EMI / combination SR 15		Visual NDT after Heat Treat surfaces ID/OD orientation Long / Tran Wet Fluorescent MPI Dimensional tool joint OD/ID length OD Pin/Box	Visual Wet Fluorescent MPI 1/16" vertical through hole UT - 45° x 2.25mhz Dimensional OD / ID Straightness End Drift
G to SR 2	NDT 5% ID/OD Long / Trans UT or EMI / combination Wall				
S	Visual NDT 5% notches - ID/OD Long / Trans UT or EMI / combination Wall	SR 15		Visual NDT after Heat Treat surfaces ID/OD orientation Long / Tran Wet Fluorescent MPI Dimensional tool joint OD/ID length OD Pin/Box	Visual Wet Fluorescent MPI 1/16" vertical through hole UT - 45° x 2.25mhz Dimensional OD / ID Straightness End Drift

PSL-1	Wall thickness shall be verified in a helical or longitudinal path over the full length to confirm conformance to the thickness criteria of this Standard. For the surface area covered by the automated system no minimum coverage.
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API Standards for Pipe Inspections

PSL 1 – Wall thickness requirement minus 87.5%rw (12.5%)

Grades E, X, G except S (5% flaw)

Annex E (optional supplementary requirements)

SR2 inspection - 5% reference on drill pipe body for grades E, X and G

SR15 drill-pipe - Test certificates

SR19 pipe body - Charpy V-notch impact toughness testing of grade E

SR20 alternative low-temperature - Charpy V-notch impact requirements

SR23 weld zone - Lot size

SR24 Charpy V-notch — Increased weld-zone requirements

PSL 2 / PSL 3 - have additional mandatory requirements

PSL 2 – mandatory SR2, SR15, SR19

PSL 3 – CVN, Tool Joint Y strength, hardness test

API Standards for Pipe Inspections

New Drill Stem Elements

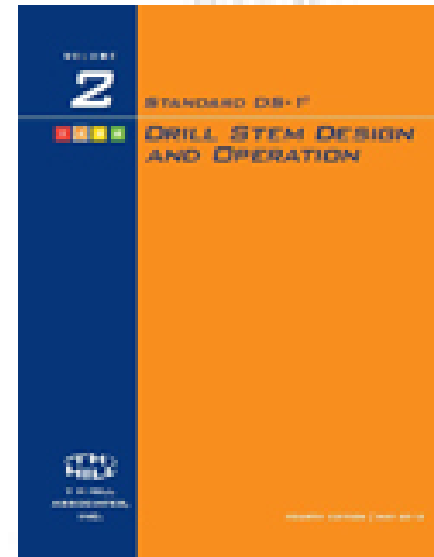
TH Hill 4th Edition

DS-1 Volume 1

DS-1 Volume 2



Drilling Tubular
Product
Specification



Drill Stem
Design and
Operation

API Standards for Pipe Inspections

Used Drill Stem Elements

RP7G

RP7G-2

Recommended Practice for Drill Stem Design and Operating Limits

API RECOMMENDED PRACTICE 7G
SIXTEENTH EDITION, AUGUST 1998

EFFECTIVE DATE: DECEMBER 1998
ERRATA: MAY 2000



Helping You
Get The Job
Done RightSM



Recommended Practice for Inspection and Classification of Used Drill Stem Elements

ANSI/API RECOMMENDED PRACTICE 7G-2
FIRST EDITION, AUGUST 2009

ISO 10407-2:2008 (Identical), Petroleum and natural gas
industries—Rotary drilling equipment—Part 2:
Inspection and classification of used drill stem elements



API Standards for Pipe Inspections

Risk Managing Projects

- fit-for-purpose or application-based solutions

Structural Compatibility

- Tensile Strength
- Torsional Strength
- Pressure, Collapse
- Bending

Cost

- Increase Reliability
- Increase Performance
- Increase Life

Geometric Compatibility

- Hydraulics
- Fishability

API Standards for Pipe Inspections

Drilling Environment vs Inspection Levels

Inspection Level	Loads <i>% of capacity</i>	Project Risk	Operating Life
Standard	40	Low	Short
Moderate	40 to 70	Medium	Standard
Critical	70	High	Long
Extreme	80	Very high	Very long

Corrosivity	Abrasiveness	Fatigue	Mud Weight	Rotation Hours
Low	Low	< 2°/100ft	< 12,0 lb/gal	< 100 hrs
Moderately	Moderately	2° to 4°/100ft	12 to 16 lb/gal	> 100 hrs
Corrosive	Abrasive	> 4°/100ft	> 16 lb/gal	> 300 hrs
Brine	Very Hard	> 10°/100ft	> 18 lb/gal	> 500 hrs

API Standards for Pipe Inspections

Used Drill Stem Elements

API RP7G-2 Annex B tables - Inspections

Table B.1

Drill Pipe

Table B.2

Tool Joints

Table B.3

BHA – Connections Only

Table B.4 to B.14 (exclude Connections)

Drill Collars, Subs, HWDP, Kellys / Top Drives, Stabilizers,
Jars, MWD/LWD, Motor / Turbine, Reamer / Scrapers,
Rotary Steerable, Proprietary Tools

Table B.15

Work Strings

API Standards for Pipe Inspections

Used Drill Stem Elements

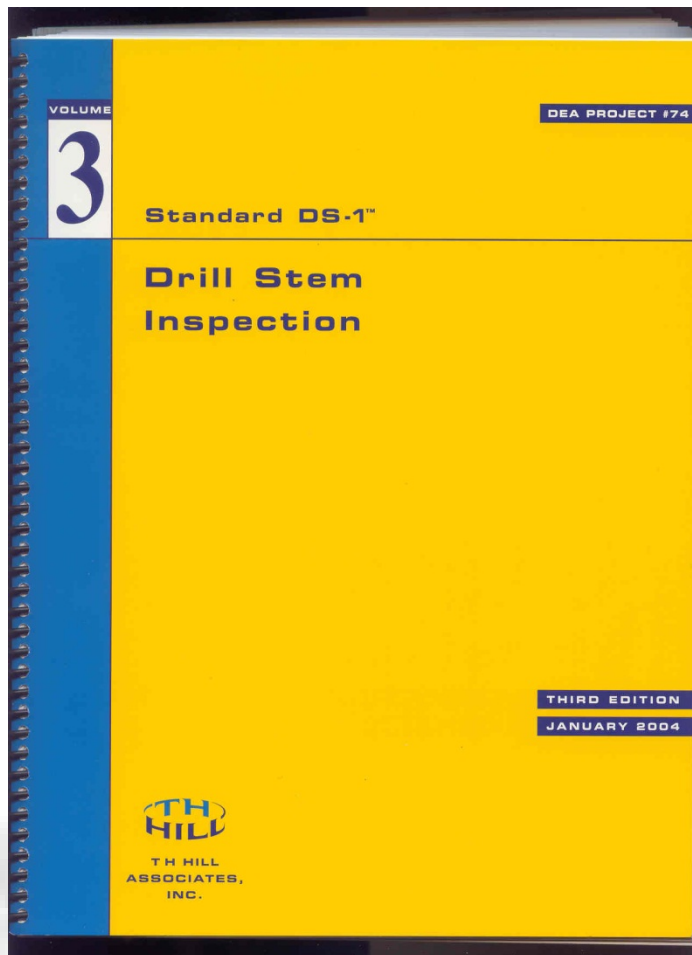
TH Hill

DS-1

3rd edition

DS-1

4th edition



API Standards for Pipe Inspections

TH Hill

DS-1 Volume 3 - 4th edition



Volume 3
Inspection of Drill String
Equipment

consisting of a single piece
with no component pieces

Drill Pipe
Drill Collars
Subs
Pup Joints

API Standards for Pipe Inspections

Used Drill Stem Elements

Tube Body

Drill Pipe Inspection	API RP7G-2					DS-1 Category				
	Standard	Moderate	Critical	Extreme		1	2	3	4	5
Table B.1					Table 2.2					
Full-length visual	10.1	10.1	10.1	10.1	Visual Tube	3.4	3.4	3.4	3.4	3.4
OD gauging	10.2	10.2	10.2	10.2	OD Gauging		3.5	3.5	3.5	3.5
UT wall measurement	10.3	10.3	10.3	10.3	UT Wall Thickness Spot		3.6	3.6	3.6	3.6
Full-length EMI	10.4	10.4	10.4	10.4	Electromagnetic Scan			3.7	3.7	3.7
Full-length ultrasonic (transverse and wall thickness)	10.5	10.5	10.5	10.5	FLUT 1			3.31	3.31	3.31
Critical full-length ultrasonic (transverse, longitudinal and wall thickness)			10.6	10.6	FLUT 2 (HDLS) 3.32			3.32	3.32	3.32
MT critical area	10.7	10.7	10.7	10.7	MPI/Slip Area				3.9	3.9
MT critical area, external bi-directional			10.8	10.8						
Full-length wall monitoring		10.9	10.9	10.9	Full Length Wall Monitor			3.31	3.31	3.31
UT of critical area		10.10	10.10	10.10	UT Slip Area					3.10
Calculation of the minimum cross-sectional area				10.11						
Documentation review				10.12						3.34
MT critical area, internal				10.61						
MT critical area, internal bi-directional				10.62						

API 7G2 - Either EMI or FLUT may be used for a specified wall thickness of 0.500 inch or thinner.
FLUT is required on tubes with a wall thickness greater than 0.500 inch

DS-1 UTFL >.400" Wall

API Standards for Pipe Inspections

Used Drill Stem Elements

Tool Joint

Drill Pipe Inspection	API RP7G-2					DS-1 Category				
	Standard	Moderate	Critical	Extreme		1	2	3	4	5
Table B.2					Table 2.2					
Visual inspection of Bevels, Seals, Threads, Markings (Weight Code/Grade) and Outside Diameter	10.14	10.14	10.14		Visual Connection	3.11	3.11	3.11	3.11	3.11
Hardband	10.59	10.59	10.59		(pipe grade, seal, threads, bevels, hardband,	3.11	3.11	3.11	3.11	3.11
Box Swell and Pin Stretch	10.15	10.15	10.15		box swell, pin stretch)	3.11	3.11	3.11	3.11	3.11
Pin and Box OD and Eccentric Wear	10.17	10.17			Dimensional 1		3.12	3.12	3.12	3.12
Measure Pin and Box OD and check Eccentric Wear			10.18		(measure TJ Box OD / Pin ID		3.12	3.12	3.12	3.12
Pin and Box Tong Space	10.19	10.19			tong space, box shoulder width		3.12	3.12	3.12	3.12
Measure Pin and Tong Space			10.20		Dimensional 2				3.13	3.13
MT Pin Threads		10.21	10.21		(measure pin tong space					3.15
MT Box Threads			10.22		Black Light Connection					3.15
Measure Pin Inside Diameter			10.23		Black Light Connection					3.15
MT OD Heat-Check Cracks		10.24			Dimensional 1				3.13	3.13
MT OD Heat-Check Cracks, Bi-Directional, Wet MPI only			10.25		Heat Checking				3.8	3.8
MT Transverse Tool Joint OD and Pin under Internal Threads			10.60		Heat Checking				3.8	3.8
Measure Counter-bore depth, Pin-base Length, Seal Width, Check Shoulder Flatness, Tapered Shoulder Angle, Elevator Contact Area				10.26	Black Light Connection					3.15
					Tong space, C'-bore depth / diameter, bevel diameter, pin neck)				3.13	3.13

API Standards for Pipe Inspections

Used Drill Stem Elements

Grant Prideco XT

[illegible]

API Standards for Pipe Inspections

TH Hill

DS-1 Volume 4 - 4th edition



Volume 4 Inspection and Use of Specialty Tools

Mud Motors

MWD

LWD

Under-Reamers

Safety Valves

plus over 70 more specialty
tools apply

API Standards for Pipe Inspections

Onsite Inspections

- Real Time Information
- Drill Pipe Scout Report



API Standards for Pipe Inspections

Drill Pipe Report

DRILL PIPE INSPECTION REPORT

The result of tool inspection reported by the company to the customer represent good faith opinions only and are not to be considered warranties or guarantees of quality, classification or usability of tool inspection

CUSTOMER: **GREYWOLF DRILLING** LOC. **GREYWOLF YARD La.** Well: **Rig 519** Date: **May 7, 2007** Type **Hardband** Inspector(s): **BRIAN KNOPIK NICK BOMERO RAFAEL** Tuboscope WO No. **1188302-2**

Criteria > Premium T.J	Max ID 3 13/32	Min OD 6 5/16	Min Wall 0.290	Min Shd Cyl 20/64	Min Seal Neck 21/64	Grade: Class 2 T.J	Max ID 3 5/8	Min OD 6 3/16	Min Wall 0.253	Min Shld 25/64	Min Seal 19/64	Min Turg Space PIN 4 3/4	Max Turg Space BOX 6 1/8	C Bore Diam Max 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore Diam Min 5 3/8	Bevel Max Diam 6 3/32	C Bore 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API Standards for Pipe Inspections

Contains all Measurements Required by DS-1 / 7G2

DRILL PIPE INSPECTION REPORT

CUSTOMER:		Cust #		LOC.		NOV Tuboscope		Raised or Flush		Inspector(s)																					
Region Name		Loc.Name/Code:		Well:		Rig		Date		Type HB		Raised																			
Size	4"	lbs/Ft	14.00	Grade:	S135	Conn:	HT38	Mfg:	NOV Grant	Range	II	Nom. Wall	0.330	In.	Insp. Spec.	Weatherford	Customer Spec	Cust Dim	Wet Mag TJ Type II	5 Ch EndSorr Wavi											
Criteria >	Max ID	Min OD	Min Wall	Min Shld/Cyl	Min Seal Nose	Yellow	Max ID	Min OD	Min Wall	Min Shld	Min Seal	Min Tong Space PIN BOX		CBore Max	Diam Min	Bevel Max	Diam Min	CBor Wall minDepth	Min Pin Length (HT ONLY)	Max I Pin L											
Premium TJ	2.813	4.750	0.264	0.313	3.172	Class 2 TJ	2.844	4.844	0.231	0.281	0.281	6.000	8.000	4.109	4.047	4.794	4.637	0.313	5.496	5											
TUBE BODY												Pin Connection										Box Connection									
Pipe No.	S/N	Mo./Year Serviced	OD GAUGE	PERCENT OD WEAR	Bent Straighten	SLIP AREA TUBE MASH	Pipe Tally	EMI FLUT	UTEA	Plastic Coating	Pipe Prep Low Wall	Remaining Wall	Tube Class	Tool Joint Year	PIN ID	PIN OD	Thrd / Seal Cond.	Tong Space	Bevel Diameter	Lead	Max Neck Length HT	Reface	Hardband	ID Over Under	Final Condition	BOX OD	Thrd / Seal Cond.	Tong Space	CBore Diameter	Min CBore Depth-Wall	Shdr Width Cyl Diam
26	451.000		OK	<1/32				Y	OK	1	0.330	0.330	PR		2.438	5.000										5.000					
27	379.000		OK	<1/32				Y	OK	1	0.333	0.333	PR		2.438	5.000										5.000					
28	204.000		OK	<1/32				Y	OK	1	0.319	0.319	PR		2.563	5.000										5.000					
29	324.000		OK	<1/32				Y	OK	1	0.304	0.304	PR		2.563	4.969	RF					Y			RF	4.969					
30	88.000		OK	<1/32				Y	OK	1	0.306	0.306	PR		2.563	4.969	RF					Y			RF	4.969	RF				
31	9.000		OK	<1/32				Y	OK	1	0.309	0.309	PR		2.563	4.969										4.969					
32	373.000		OK	<1/32				Y	OK	1	0.338	0.338	PR		2.438	5.000										5.000					
33	79.000		OK	<1/32				Y	OK	1	0.296	0.296	PR		2.563	4.969	RF					Y			RF	4.969					
34	397.000		OK	<1/32				Y	OK	1	0.334	0.334	PR		2.438	5.000										5.000	RF				
35	24.000		OK	<1/32				Y	OK	1	0.299	0.299	PR		2.563	5.000										4.969	RF				
36	441.000		OK	<1/32				Y	OK	1	0.335	0.335	PR		2.438	5.000										5.000					

API Standards for Pipe Inspections

Tuboscope  **Drill Pipe Summary Report**

Date: May 7, 2007

Customer: GREYWOLF DRILLING Customer PO No. 0 Tuboscope WO No. 1188302-2

Loc. GREYWOLF YARD Lt Well: 0.00 Rig: 519.00 Customer Ref. No. 0 Tuboscope Job No. 0

Size 5" Nom. Weight: 19.50 Grade S135 Nom. Wall 0.362 in. Rg II Connection NC50

Type Hardband Present (if any) 0.00 Flush Norm TJ O.D. 6.63 Nom. TJ. Pin I.D. 2.75 Manufacturer Grant/Prideo

Type of Inspection:

DS-1	Cat-5	Dim 2	5 Ch EndSonic Shear & Comp	Dry Mag TJ Upset & Slip	Clean & Visual / Redope
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Inspected

392 Premium (one punch mark in taper and two white bands)

TALLY PR -

Repairs Made During Job

FIELD REPAIRS ON PREMIUM CLASS										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seals Refaced		Threads Recut during Job		Hardband Applied		Type Hardband Applied		DS1		DS2		COATED ?		YES NO		
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
60	85	15	0	0	0	0	0	0	0	0	0	0	0	0	0	

10 Premium Needing Shop Repair

SHOP TALLY PR -

Repairs Made During Job

SHOP REPAIRS ON PREMIUM CLASS										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seal Damage To Be Refaced		Thread Damage Shop To Be Recut		Undersize Tool JT		Cracked Thread		Bell ID		Pin ID		Requires Hardband				
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
0	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	

0 Class 2

TALLY C2 -

Repairs Made During Job

FIELD REPAIRS ON CLASS 2										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seals Refaced		Threads Recut during Job		Hardband Applied		Type Hardband Applied		DS1		DS2		COATED ?		YES NO		
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Repairs Made During Job

SHOP REPAIRS ON CLASS 2										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seal Damage To Be Refaced		Thread Damage Shop To Be Recut		Undersize Tool Joint OD		Cracked Thread		Bell ID		Pin ID		Requires Hardband				
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

0 Class 2 Shop

SHOP TALLY C2 -

Repairs Made During Job

SHOP REPAIRS ON CLASS 2										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seal Damage To Be Refaced		Thread Damage Shop To Be Recut		Undersize Tool Joint OD		Cracked Thread		Bell ID		Pin ID		Requires Hardband				
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

(two punch marks in taper and one yellow band)

0 Class 3

TALLY C3 -

Repairs Made During Job

SHOP REPAIRS ON CLASS 2										VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seal Damage To Be Refaced		Thread Damage Shop To Be Recut		Undersize Tool Joint OD		Cracked Thread		Bell ID		Pin ID		Requires Hardband				
Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Pin	Box	Both	Both	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

(three punch marks in taper and one orange band)

9 Scrap C5

Scrap TALLY C5 0.00

Repairs Made During Job

SEVERE Mechanical Damage Bent Beyond Repair, etc.			
9	0	0	0

(five punch marks in taper and one red band)

411 Total Lengths Inspected

0 TOTAL Straightened Prior to Insp.

2 BENT TUBE / NOT INSPECTED

STRAIGHTENED NORMAL	STRAIGHTENED ABNORMAL	UNINSPECTED BENT NORMAL	UNINSPECTED BENT ABNORMAL
0	0	2	0

Total Feet -

Feet Ready for Service -

Serviced By: BRIAN KNOPIK/NICK ROMERO RAFAEL RAMIREZ

Comments: 2 JTS = PREM. CLASS BENT - INSPECTED(WHITE PAINT BAND MIDDLE OF TUBE). PIPE MISSING 56 BOX END THREAD PROTECTORS. 76 JTS = BOX END SMOOTH EDGE HARDBAND WORE DOWN FLAT - TO TOOL JOINT OD, ALL HARDBAND IS WORE FLUSH - REAPPLICATION OF HARDBAND IS RECOMMENDED ON ENTIRE STRING. TOTAL JTS INSPECTED TO DS1-CAT. 5 WITH BLACKLIGHT CONNS - 411 198 MILES TO JOB & 198 MILES RETURN FROM JOB.

Summary Report

- Complete String Description
- Classifies Pipe
 - Premium Condition
 - Repairable
 - Scraps
 - Hardband Condition
 - Internal Coating Condition
 - Connection Condition

API Standards for Pipe Inspections



PREMIUM DRILL PIPE INSPECTION ANALYSIS REPORT

Customer: GREYWOLF DRILLING
Location: GREYWOLF YARD La.
Well Name: 0

DATE: 05/07/07
Rig: 519

MATERIAL DESCRIPTION:
SIZE 5" WEIGHT 19.5 GRADE S135 NOM BW: 0.362 in.
Mfg: Grant/Prideco

CONN. NC50 Range: II NOM. T.J. O.D. 6 5/8 NOM. Pin T.J. I.D. 2 3/4

SUMMARY OF RESULTS
411 Total Lengths Inspected Total Premium Tally
392 Lengths PREMIUM - Feet
10 Premium in need of Repair
9 Downgraded w/<80% RBW - Not Serviceable

Type Hardband: 0 Flush
HARDBANDED DURING JOB CONNECTIONS NEED Hardband or HB Repair
VISUAL COATING ANALYSIS

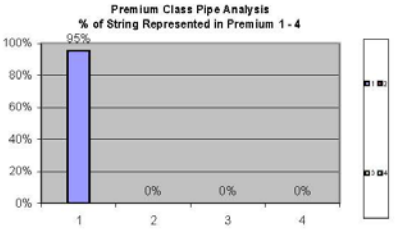
PIN	BOX	PIN	BOX	DS1	1	2	3	4	BARE	Bent Normal Not Insp.	Bent Abnrl Not Insp.
-	-	-	-	NS2	A	B	C	D	0	2	0
0%	0%	0%	0%	402	402	0	0	0	0%	0%	0%

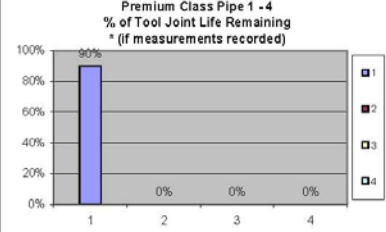
No HB Present > 411 76

PREMIUM CLASS
TUBE WALL REDUCTION & TJ ANALYSIS*
Nominal Wall & TJ Readings 0.362 Tube Wall % R.B.W. T.J. O.D. T.J. Rem.
Wall & TJ Downgrade Points 0.290 100% 6.625 100%
Note: 100% TJ Life Equals 0.3125 0.156 (Per Side) 80% 6.313 0%

RESULTS:
RBW Unit of Measure: Inches

	% OF STRING	Pipe Tally Feet	AVG RBW	% R.B.W.	T.J. O.D.	% T.J. Rem.
392 Prem Plus >95% R.W.	0.344 to 0.362	95%	-	0.373	103%	6.593
- Prem 91% to 95% R.W.	0.329 to 0.343	0%	-	-	0%	-
- Prem 86% to 90% R.W.	0.311 to 0.328	0%	-	-	0%	-
- Prem 81% to 85% R.W.	0.290 to 0.310	0%	-	-	0%	-
392 Total Lengths Premium		95%	-	0.093	26%	6.593
10 Premium in need of Repair		2%	0.00			
- Downgrade < 80% R.W.	0.000 to 0.289	0%	-			
9 Cracked		2%				
411 Total Lengths Inspected		100%	Total % Accounted			

Premium Class Pipe Analysis
% of String Represented in Premium 1 - 4


Premium Class Pipe 1 - 4
% of Tool Joint Life Remaining* (if measurements recorded)


Analytical Report

- String Classification Snap Shot
- Remaining % of String Life
 - Tube Body
 - Tool Joints
 - Wall Thickness
- Several Categories
 - > 95% Premium Plus
 - > 91% to 95%
 - > 86% to 90%
 - > 81% to 85%

API Standards for Pipe Inspections

Drill Pipe Scout Key Features

Comprehensive reporting

Trending system

Comprehensive Analysis

by Fleet, Rig, String, Size,
Grade, SN or Joint

Tracks

- Tube Body Wear Trends
- Tool Joint Wear Trends
- Hardband Wear Trends
- Coating Condition



API Standards for Pipe Inspections

Drill Pipe Scout Benefits

- Cradle to Grave
- String Knowledge
 - Inspection
 - Coating
 - Repairs
- Improve Capital Expenses
- Risk Management Tool



API Standards for Pipe Inspections

Connections



Care & Handling





API Standards for Pipe Inspections

Tool Joint Compound



Contaminated



Grease



Thread Protection
Is Very Important

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Proper Thread Compound Application



Threads
&
Seals

API Standards for Pipe Inspections

Improper Thread Compound Application



Voids
&
Holidays

API Standards for Pipe Inspections

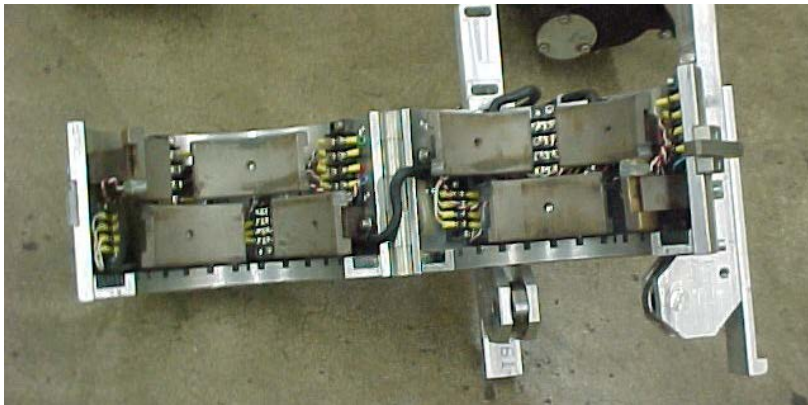
Reasons for inspection

- Severe Galling in connection
- Improper Make-up (misalignment, dirt, wrong lubrication, too little lubrication)
- Fatigue Cracking
- Abrasive wear (reduced Wall Thickness)
- Erosion
- Corrosion

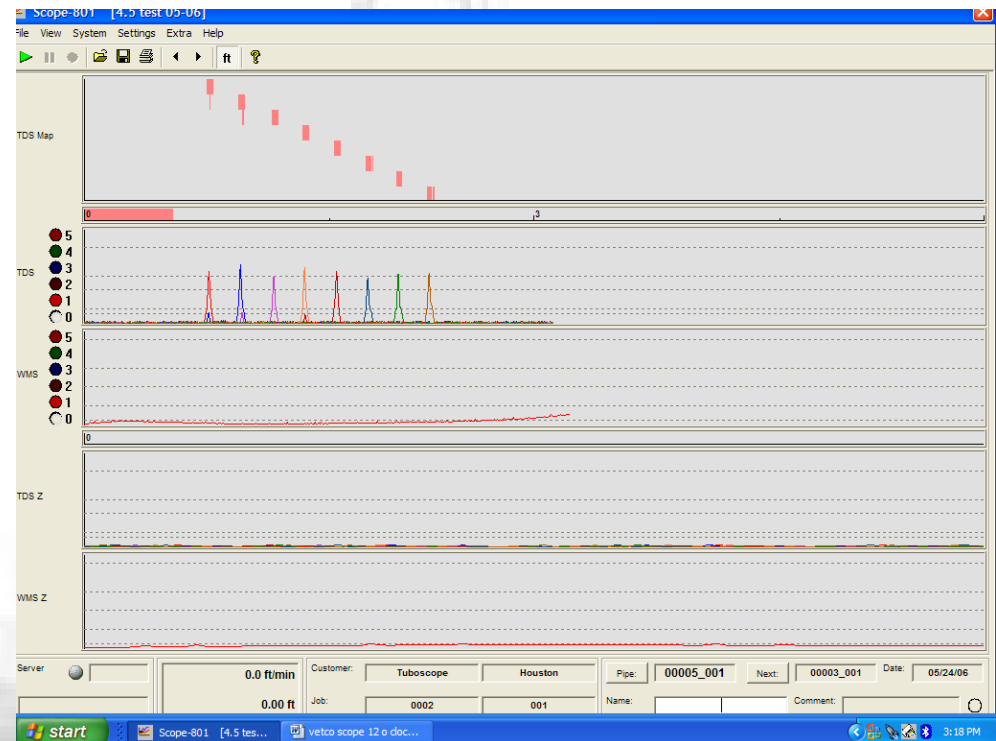
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Electromagnetic Inspection

*EMI field inspection buggy
with EMI Wall*



*EMI computer display
eight Flaw Channels of Data*



API Standards for Pipe Inspections

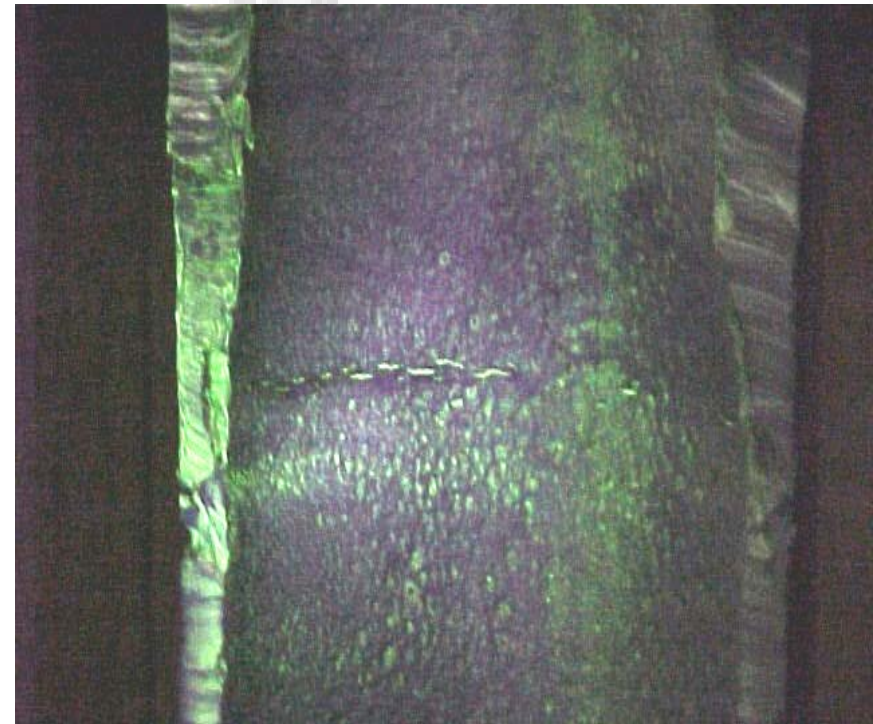
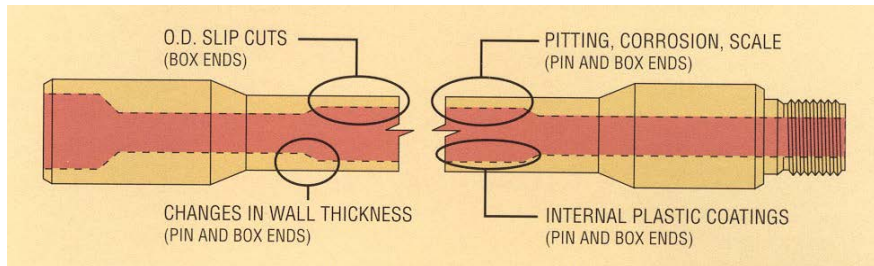
Electromagnetic and Endsonic Inspection Complement



Most
Washouts
in
Slip Area

API Standards for Pipe Inspections

Ultrasonic Scanning – Endsonic Tool

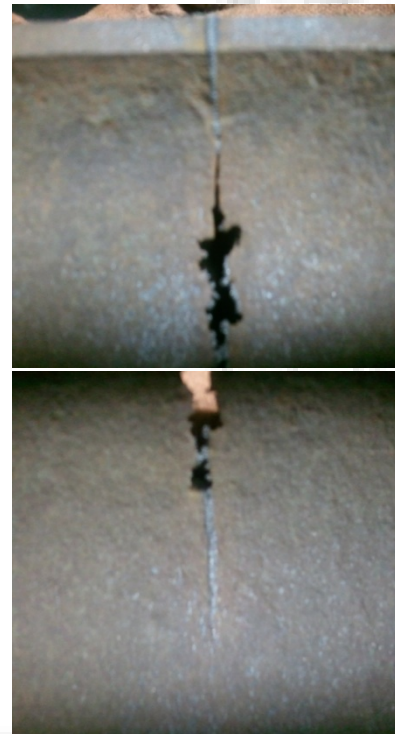
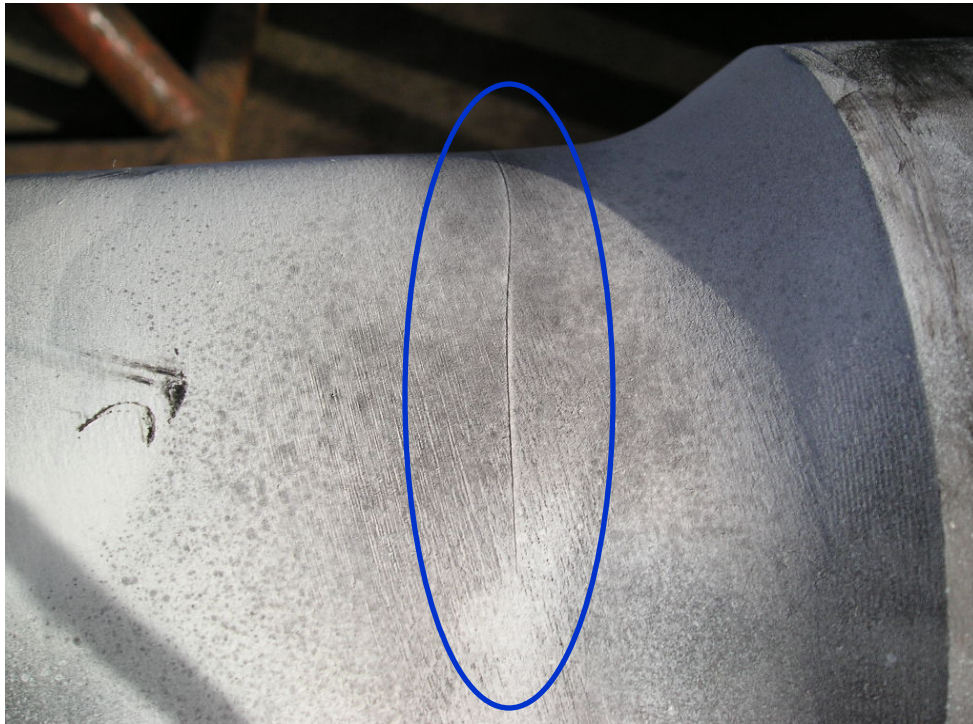


Wet Fluorescent MPI
Fatigue Cracking



API Standards for Pipe Inspections

Severe Cracking



Failures – Washouts fatigue Cracking

API Standards for Pipe Inspections

Black Light

Wet Mag

Tool Joint Inspection
Includes Threads

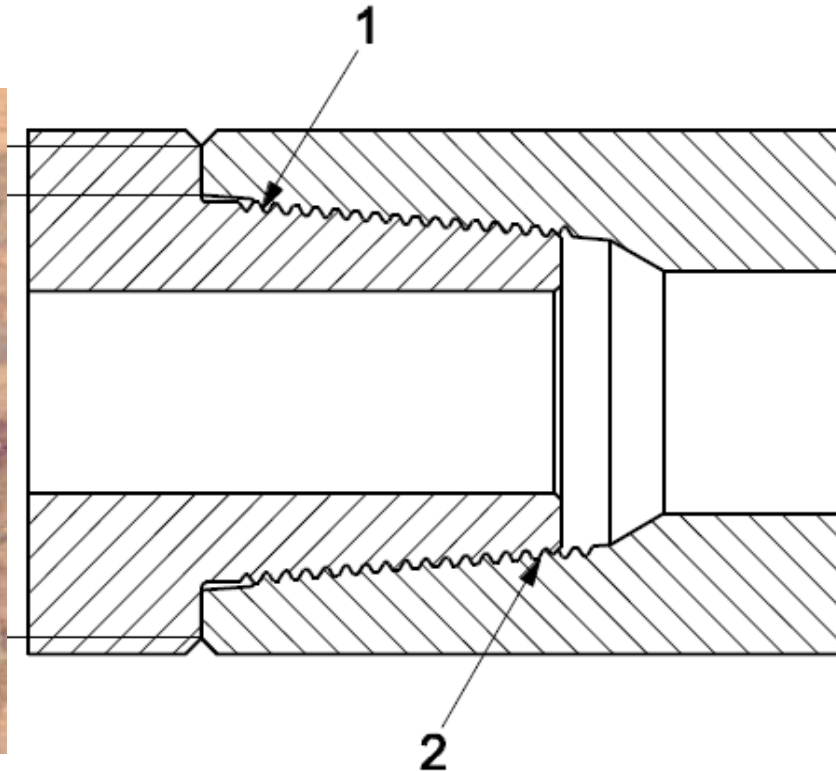


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Connections

Thread Compound Protects Critical Areas

Last Engaged Thread



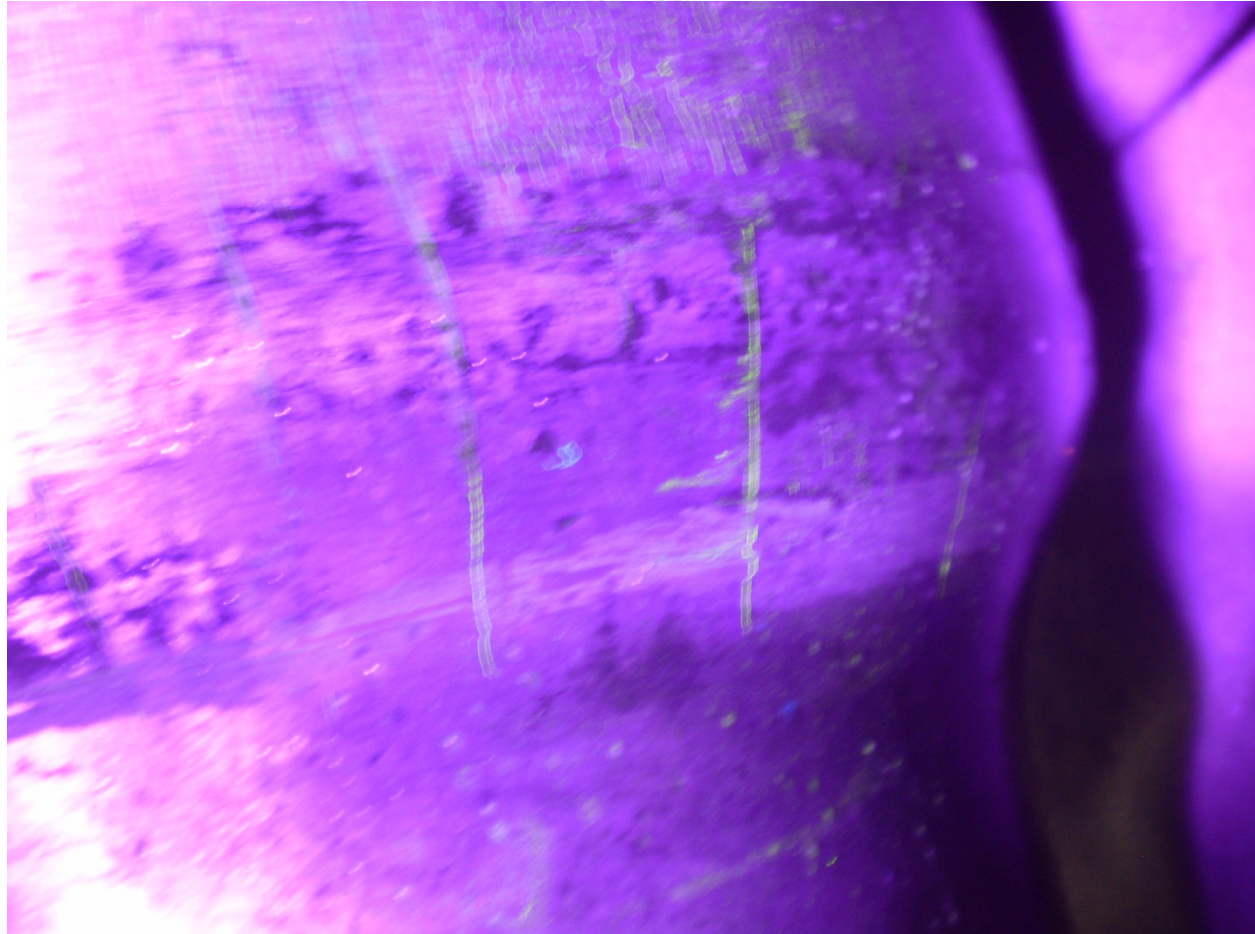
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Heat Checking

(Wet Mag)

Wet Fluorescent
Magnetic Particle
Inspection

Longitudinal
Checking



API Standards for Pipe Inspections

OD Gauging



Severe Drilling Conditions
Laterals

Reduces Wall Thickness



API Standards for Pipe Inspections

Conclusions

- Safer drilling environments are available
- Standards established to help today's Drilling
- NDT is critical tool in risk management
- Knowing wall thickness values
(purchase pipe to 95% remaining wall)
- Wall Thickness cannot be replaced / Scrap
- Risk Management Tool - Drill Pipe Scout

API Standards for Pipe Inspections



Thank You

Hilton Prejean

