

# API Standards for Pipe Inspections

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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



15<sup>th</sup>

### 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



40<sup>th</sup>

### 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

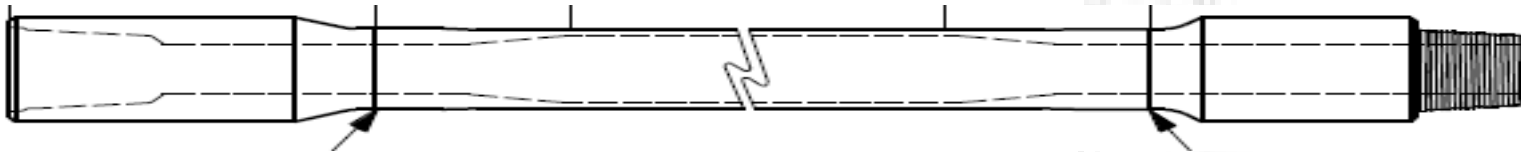
ISO 10424-2: 2007 (Identical), Petroleum and natural gas  
industries—Rotary drilling equipment—Part 2:  
Threading and gauging of rotary shouldered thread  
connection



# 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

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

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

# API Standards for Pipe Inspections

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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

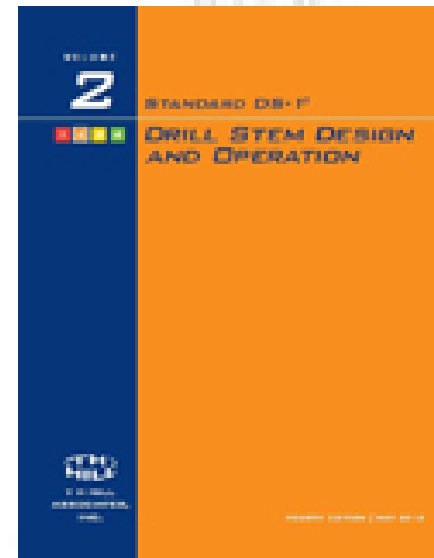
DS-1 Volume 1



Drilling Tubular  
Product  
Specification

TH Hill 4<sup>th</sup> Edition

DS-1 Volume 2



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 Right<sup>SM</sup>



#### 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

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## 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

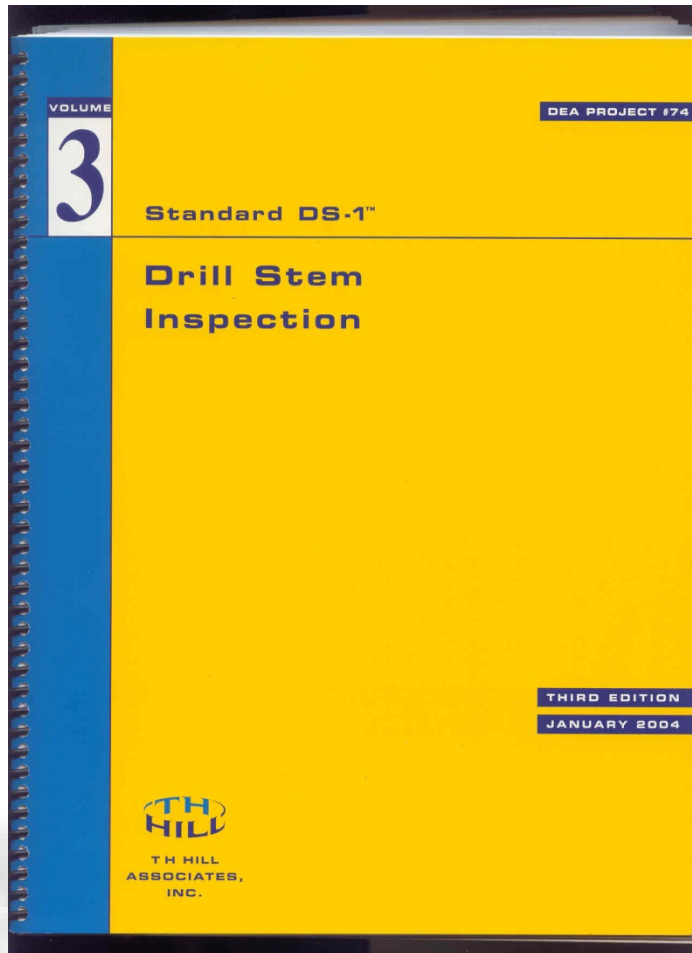
DS-1

3<sup>rd</sup> edition

**TH Hill**

DS-1

4<sup>th</sup> edition



# API Standards for Pipe Inspections

TH Hill

DS-1 Volume 3 - 4<sup>th</sup> 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		<b>Visual Connection</b>	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			<b>Dimensional 1</b>		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		<b>Dimensional 2</b>				3.13	3.13
MT Pin Threads		10.21	10.21		(measure pin tong space					3.15
MT Box Threads			10.22		<b>Black Light Connection</b>					3.15
Measure Pin Inside Diameter			10.23		<b>Black Light Connection</b>					3.15
MT OD Heat-Check Cracks		10.24			<b>Dimensional 1</b>				3.13	3.13
MT OD Heat-Check Cracks, Bi-Directional, Wet MPI only			10.25		<b>Heat Checking</b>				3.8	3.8
MT Transverse Tool Joint OD and Pin under Internal Threads			10.60		<b>Heat Checking</b>				3.8	3.8
Measure Counter-bore depth, Pin-base Length, Seal Width, Check Shoulder Flatness, Tapered Shoulder Angle, Elevator Contact Area				10.26	<b>Black Light Connection</b>					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

Proprietary Thread Inspection					API RP7G-2				DS-1 Category					
					Standard	Moderate	Critical	Extreme	1	2	3	4	5	
Annex F					Section 3.13									
Addition to Visual Connection									Dimensional 2					
Pin / Box Connection Length						F.2.3.2	F.2.3.2	F.2.3.2	Box Connection Length				3.13	3.13
Pin Nose Diameter						F.2.3.3	F.2.3.3	F.2.3.3	Pin Nose Diameter				3.13	3.13
									Pin Connection Length				3.13	3.13
Pin Base Diameter						F.2.3.4	F.2.3.4	F.2.3.4	Pin Cylinder Diameter				3.13	3.13

# API Standards for Pipe Inspections

TH Hill

DS-1 Volume 4 - 4<sup>th</sup> 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

Tubo Job No.

Cust. Ref. No.

Size	5"		lbs/Ft		19.50		Grade:		S135		Conn:		NC50		Mfg:		Grant/Prisco		Range		II		Nom Wall		0.382		in.		Insp. Spec.		DS-1		Cat-5		Dim 2		6 Ch End-Center Shear & Comp		Dry Mag T.J. Upset & Slip		Clean & Visual / Redox		Cust. Ref. No.						
Criteria > Premium T.J	Max ID 3 13/32	Min OD 6 5/16	Min Wall 0.290	Min Shld-Cyl 20/64	Min Seal Nose 21/64	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 Tully Space PIN	Min Tully Space BOK	Core Wall Max 5 3/8	Bevel Max 5 3/32	Dim 2	Min Pin Length (HT)	Max Pin Neck Pin Lgth (HT) 9/16	Nom OD T.J 6 5/8	Tally Unit of Measure Feet	Nom Pin I.D. T.J 2 3/4																											
TUBE BODY																								Pin Connection												Box Connection													
Pipe No.	S.N.	No./Year Serviced	OD GAUGE	PERCENT OD WEAR	Bent Straighten	S.P. AREA TUBE MSH	Pipe Tully	EMI FLUT	UTE4	Plastic Coating	Pipe Prep Low Wall	Remaining Wall	Tube Cast	Tool Joint Year	P.N. D	PIN OD	Third / Seal Cond.	Tong Space	Bevel Diameter	Lead	Max Neck Length-HT	Refuse	Hardband	D Over OD Under	Final Condition	BOX 2D	Third / Seal Cond.	Tong Space	CBore Diameter	Min. Clave Depth-Wall	Shd. With Cyl. Diam	Bevel Diameter	Seal Width Nose Diam	Refuse	Hardband	Underize Tool J. OD	Final Condition	Primary Reason for Tube Downgrade											
377	NW50137	OK	<1/32					Y	OK	A	0.379	0.379	FR		2 3/4	6 19/32	DT	0 7/0	OK	OK	OK	None		DT	0 5/0		0 3/0	OK	OK	OK	OK	OK	OK	OK	OK														
378	NW50239	OK	<1/32					Y	OK	A	0.371	0.371	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 5/8	RF	8 15/32	OK	OK	OK	OK	OK	OK	Y	OK		RF												
379	NW50094	OK	<1/32					Y	OK	A	0.373	0.373	FR		2 3/4	6 3/8		8 1/8	OK	OK	OK	None			6 19/32		8 1/2	OK	OK	OK	OK	OK	OK	None															
380	NW50500	OK	<1/32					Y	OK	A	0.377	0.377	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 19/32		8 12/32	OK	OK	OK	OK	OK	OK	None															
381	NW50273	OK	<1/32					Y	OK	A	0.368	0.368	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 19/32		8 5/8	OK	OK	OK	OK	OK	OK	None															
382	NW50116	OK	<1/32					Y	OK	A	0.374	0.374	FR		2 3/4	6 1/2	RF	9 1/4	OK	OK	OK	Y	None	RF	6 17/32		8 1/4	OK	OK	OK	OK	OK	OK	None															
383	NW50415	OK	<1/32					Y	OK	A	0.367	0.367	FR		2 3/4	6 17/32	RF	9 1/16	OK	OK	OK	Y	None	RF	6 17/32		8 23/32	OK	OK	OK	OK	OK	OK	None															
384	NW50428	OK	<1/32					Y	OK	A	0.374	0.374	FR		2 3/4	6 17/32		9 1/16	OK	OK	OK	None			6 9/16		8 5/8	OK	OK	OK	OK	OK	OK	None															
385	NW50557	OK	<1/32					Y	OK	A	0.365	0.365	FR		2 3/4	6 17/32		9 1/4	OK	OK	OK	None			6 1/2		8 1/2	OK	OK	OK	OK	OK	OK	None															
386	NW50347	OK	<1/32					Y	OK	A	0.360	0.360	FR		2 3/4	6 9/16	RF	8 31/32	OK	OK	OK	Y	None	RF	6 1/2		8 17/32	OK	OK	OK	OK	OK	OK	None															
387	NW50274	OK	<1/32				B-N	Y	OK	A	0.363	0.363	FR		2 3/4	6 1/2		9 3/32	OK	OK	OK	None			6 1/2		8 1/2	OK	OK	OK	OK	OK	OK	None															
388	NW50173	OK	<1/32				bor end	Y	CR	A	0.374	0.374	CS		2 3/4	6 1/2		9 1/8	OK	OK	OK	None			6 17/32		8 3/4	OK	OK	OK	OK	OK	OK	None			CRACK in TUBE												
389	NW50435	OK	<1/32					Y	OK	A	0.347	0.347	FR		2 3/4	6 13/32		9 1/16	OK	OK	OK	None			6 1/2		8 1/2	OK	OK	OK	OK	OK	OK	None															
390	NW50333	OK	<1/32					Y	OK	A	0.375	0.375	FR		2 3/4	6 1/2		9 1/16	OK	OK	OK	None			6 17/32		8 5/32	OK	OK	OK	OK	OK	OK	None															
391	NW50172	OK	<1/32					Y	OK	A	0.371	0.371	FR		2 3/4	6 9/16		9 1/32	OK	OK	OK	None			6 19/32		8 5/16	OK	OK	OK	OK	OK	OK	None															
392	NW50491	OK	<1/32					Y	OK	A	0.382	0.382	FR		2 3/4	6 9/16	RF	9 1/32	OK	OK	OK	Y	None	RF	6 19/32	RF	8 9/16	OK	OK	OK	OK	OK	Y	None	RF														
393	NW50192	OK	<1/32				pin end	Y	CR	A	0.377	0.377	CS		2 3/4	6 19/32		8 7/8	OK	OK	OK	None			6 19/32		8 3/8	OK	OK	OK	OK	OK	OK	None			CRACK in TUBE												
394	NW50093	OK	<1/32					Y	OK	A	0.382	0.382	FR		2 3/4	6 19/32		8 31/32	OK	OK	OK	None			6 19/32	RF	8 3/8	OK	OK	OK	OK	OK	Y	None	RF														
395	NW50427	OK	<1/32					Y	OK	A	0.373	0.373	FR		2 3/4	6 19/32	RF	9 3/32	OK	OK	OK	Y	None	RF	6 19/32		8 1/2	OK	OK	OK	OK	OK	OK	None															
396	NW50269	OK	<1/32				bor end	Y	CR	A	0.377	0.377	CS		2 3/4	6 9/16		9 1/32	OK	OK	OK	None			6 9/16		8 7/16	OK	OK	OK	OK	OK	OK	None			CRACK in TUBE												
397	NW50431	OK	<1/32				pin end	Y	CR	A	0.375	0.375	CS		2 3/4	6 19/32		9	OK	OK	OK	None			6 5/8		8 11/32	OK	OK	OK	OK	OK	OK	None			CRACK in TUBE												
398	NW50578	OK	<1/32					Y	OK	A	0.375	0.375	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 19/32		8 17/32	OK	OK	OK	OK	OK	OK	None															
399	NW50317	OK	<1/32					Y	OK	A	0.372	0.372	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 19/32	RF	8 16/32	OK	OK	OK	OK	OK	Y	None	RF														
400	NW50569	OK	<1/32					Y	OK	A	0.374	0.374	FR		2 3/4	6 9/16	RF	0 7/0	OK	OK	OK	Y	None	RF	6 19/32		0 1/02	OK	OK	OK	OK	OK	OK	None															
401	NW50078	OK	<1/32					Y	OK	A	0.375	0.375	FR		2 3/4	6 19/32		9	OK	OK	OK	None			6 19/32		8 1/8	OK	OK	OK	OK	OK	None																




# 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		CBore Diam	Bevel Diam		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 OD 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
------	-------	-------	----------------------------	-------------------------	-------------------------

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 Joint		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			

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		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 3

TALLY C3 -

Repairs Made During Job

SHOP REPAIRS ON CLASS 3												VISUAL TUBE COATING CLASSIFICATION					API RPTG	
Seal Damage To Be Refaced		Thread Damage Shop To Be Recut		Undersize Tool Joint		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			

9 Scrap C5

Scrap TALLY C5 0.00

Repairs Made During Job

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

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


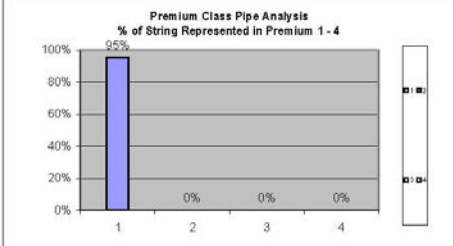
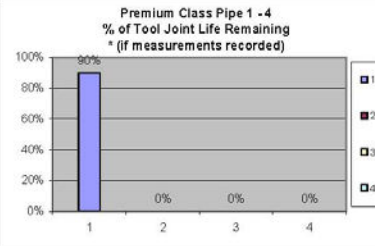
Comments:

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

Tuboscope  PREMIUM DRILL PIPE INSPECTION ANALYSIS REPORT												
Customer: <u>GREYWOLF DRILLING</u>						DATE: <u>05/07/07</u>						
Location: <u>GREYWOLF YARD La.</u>												
Well Name: <u>0</u>						Rig: <u>519</u>						
<b>MATERIAL DESCRIPTION:</b>												
SIZE: <u>5"</u>		WEIGHT: <u>19.5</u>		GRADE: <u>S135</u>		NOM BW: <u>0.362 in.</u>						
						Mfg: <u>Grant/Prideco</u>						
CONN. <u>NC50</u>		Range: <u>II</u>		NOM. T.J. O.D. <u>6 5/8</u>		NOM. Pin T.J. I.D. <u>2 3/4</u>						
<b>SUMMARY OF RESULTS</b>												
411 Total Lengths Inspected				Total Premium Tally				Tuboscope WO No. <u>1188302-2</u>				
392 Lengths PREMIUM				- Feet				Tuboscope Job No. <u>0</u>				
10 Premium in need of Repair								Customer PO No. <u>0</u>				
9 Downgraded w/<80% RBW - Not Serviceable								Customer Ref. No. <u>0</u>				
Type Hardband: <u>0</u>		Flush						Straightened Normal		Straightened Abnormal		
HARDBANDED DURING JOB		CONNECTIONS NEED Hardband or HB Repair						0%		0%		
<b>VISUAL COATING ANALYSIS</b>												
PIN	BOX	PIN	BOX	DS1	1	2	3	4		BARE	Bent Normal	Bent Abnrl
-	-	-	-	INS2	A	B	C	D			Not Insp.	Not Insp.
0%	0%	0%	0%	402	402	0	0	0	0	0	2	0
No HB Present >				411	76							
<b>PREMIUM CLASS</b>												
<b>TUBE WALL REDUCTION &amp; TJ ANALYSIS *</b>												
Nominal Wall & TJ Readings				Tube Wall		% R.B.W.		T.J. O.D.		T.J. Rem.		
Wall & TJ Downgrade Points				0.362		100%		6.625		100%		
Note: 100% TJ Life Equals				0.290		80%		6.313		0%		
RESULTS:				0.3125		0.156 (Per Side)						
RBW Unit of Measure:		Inches		% OF STRING		Pipe Tally Feet		AVG RBW		% T.J. Rem.		
392 Prem Plus >95% R.W.		0.344 to 0.362		95%		-		0.373		103%		
- 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%		
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								
<div>   </div>												

## 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

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## 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

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## Drill Pipe Scout Benefits

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



# API Standards for Pipe Inspections

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## Connections



## Care & Handling







# API Standards for Pipe Inspections

## Tool Joint Compound



## Contaminated



## Grease



Thread Protection  
Is Very Important

# API Standards for Pipe Inspections

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## Proper Thread Compound Application



Threads  
&  
Seals



# API Standards for Pipe Inspections

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## Improper Thread Compound Application



Voids  
&  
Holidays

# API Standards for Pipe Inspections

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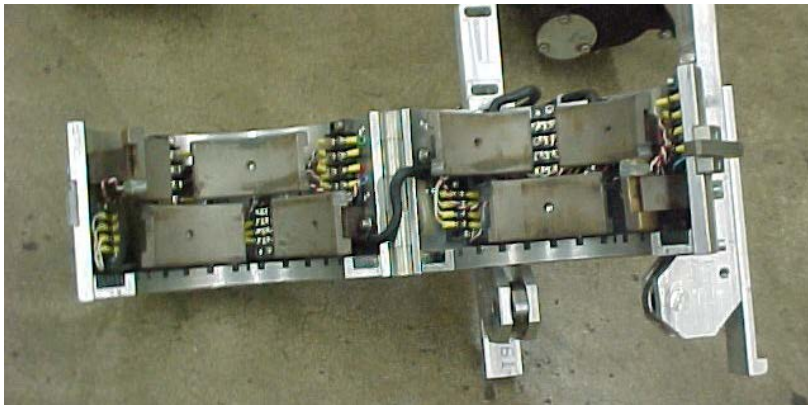
## Reasons for inspection

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

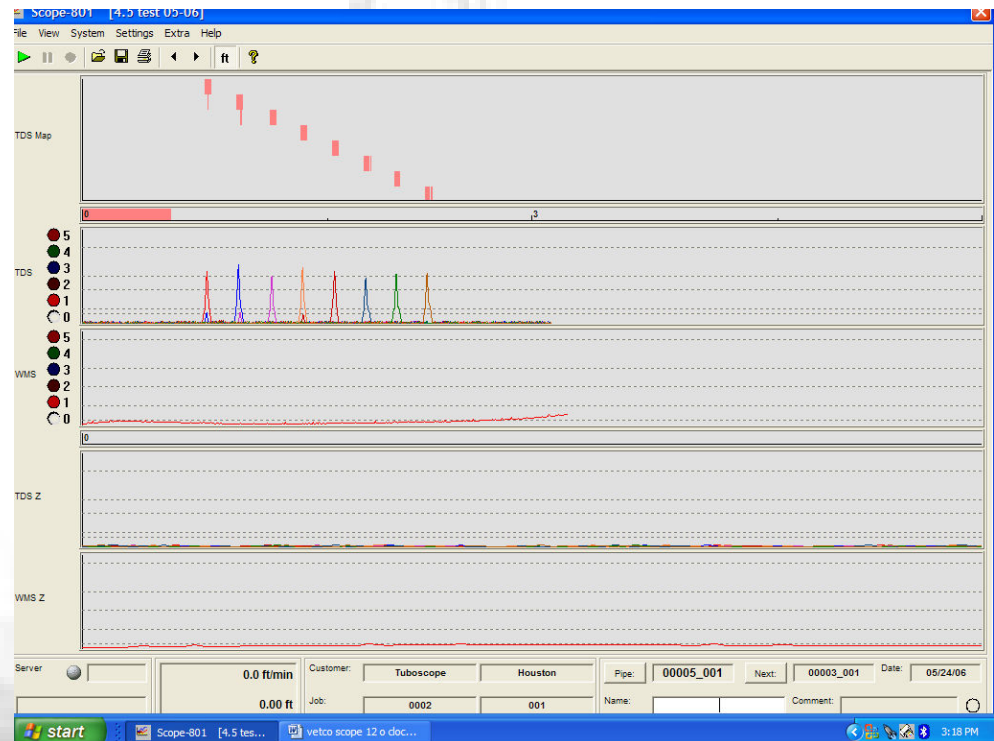
# API Standards for Pipe Inspections

## Electromagnetic Inspection

*EMI field inspection buggy  
with EMI Wall*



*EMI computer display  
eight Flaw Channels of Data*



# API Standards for Pipe Inspections

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Electromagnetic and Endsonic Inspection Complement

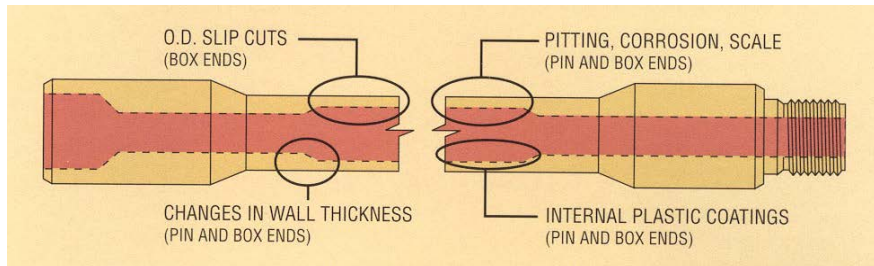


Most  
Washouts  
in  
Slip Area



# API Standards for Pipe Inspections

## Ultrasonic Scanning – Endsonic Tool

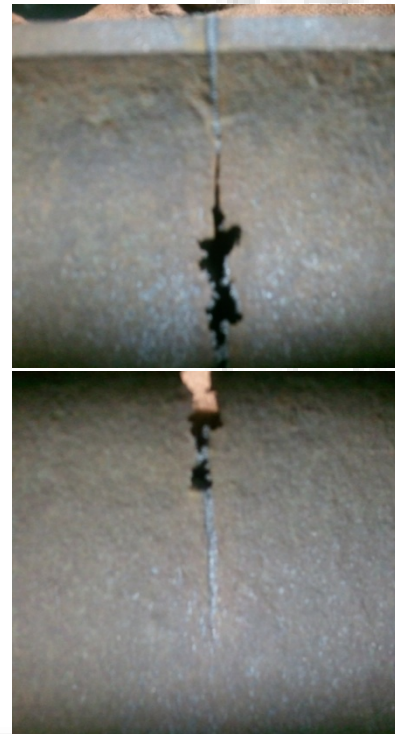
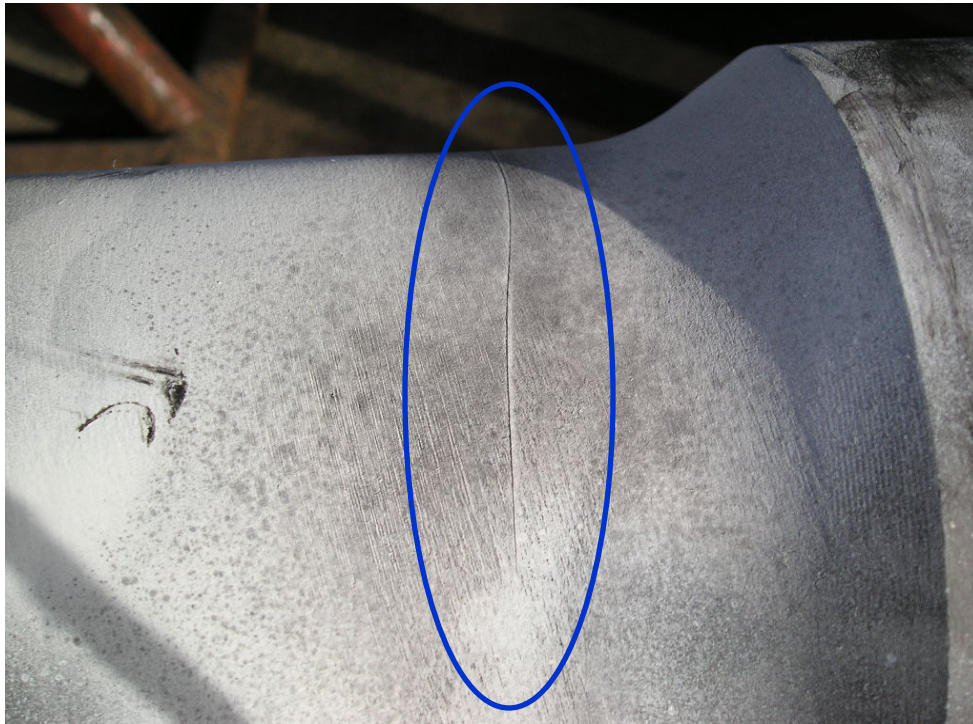


*Wet Fluorescent MPI*  
Fatigue Cracking



# API Standards for Pipe Inspections

## *Severe Cracking*



*Failures – Washouts fatigue Cracking*



# API Standards for Pipe Inspections

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Black Light

Wet Mag

Tool Joint Inspection  
Includes Threads

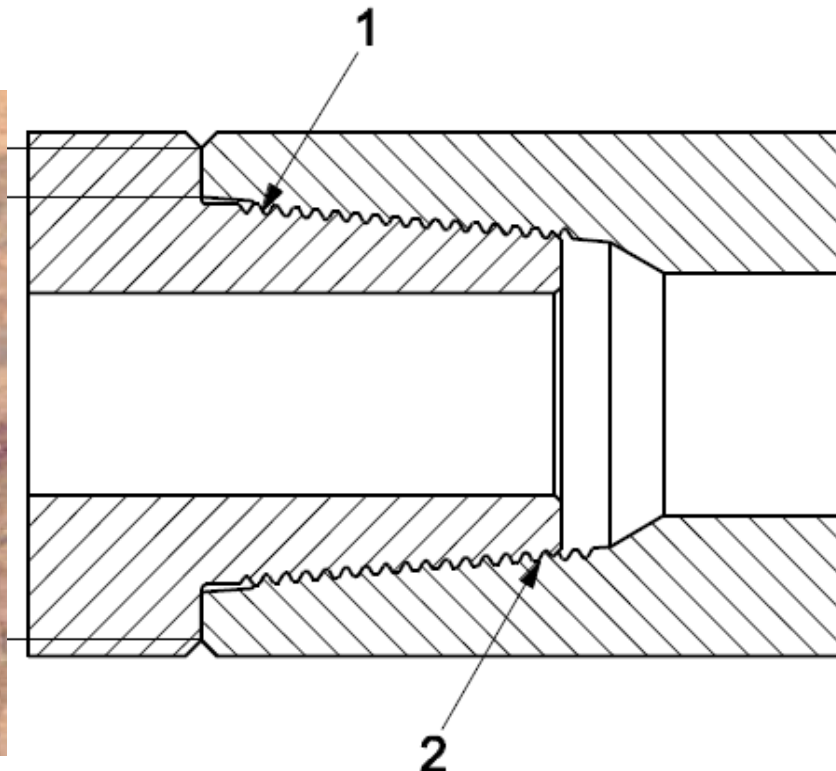


# API Standards for Pipe Inspections

Connections

Thread Compound  
Protects Critical Areas

Last Engaged Thread



# API Standards for Pipe Inspections

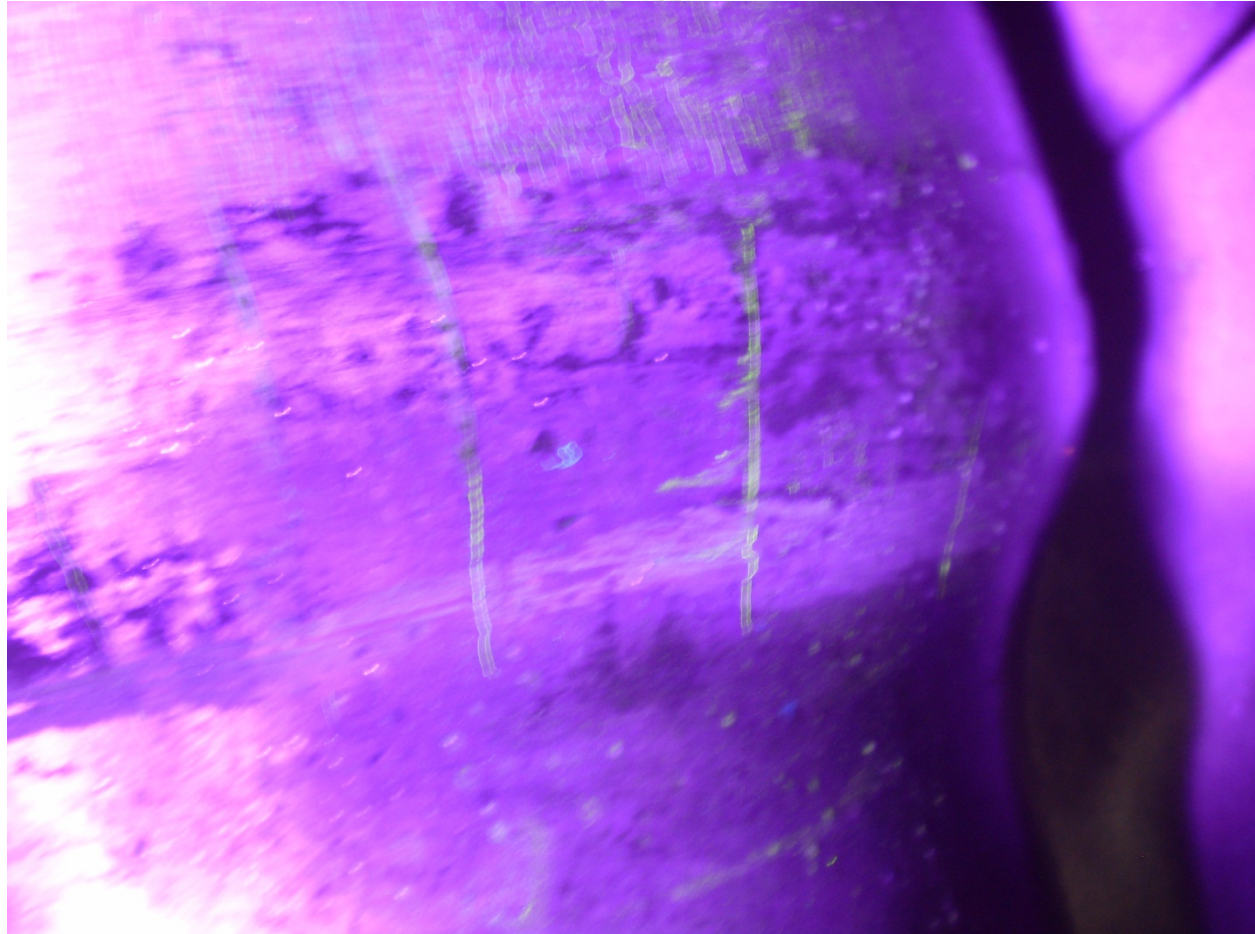
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Heat Checking

(Wet Mag)

Wet Fluorescent  
Magnetic Particle  
Inspection

Longitudinal  
Checking



# API Standards for Pipe Inspections

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## OD Gauging



Severe Drilling Conditions  
Laterals

Reduces Wall Thickness





# API Standards for Pipe Inspections

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## 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

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# Thank You

Hilton Prejean

