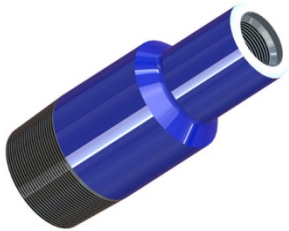






Premium OCTG accessories (casing, tubing, completion)





Premium BHA accessories (top drive saver, side entry, well control, drill string, BHA, etc.)



Model F
Float valve



Model G
Float valve



Model F float sub



Model G float sub



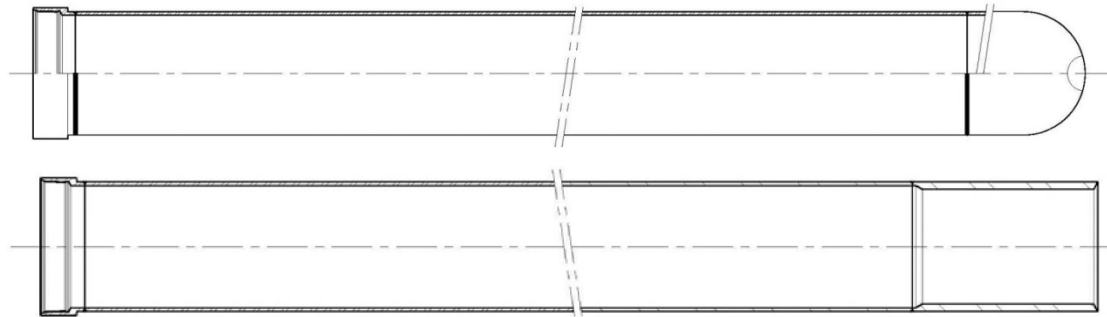
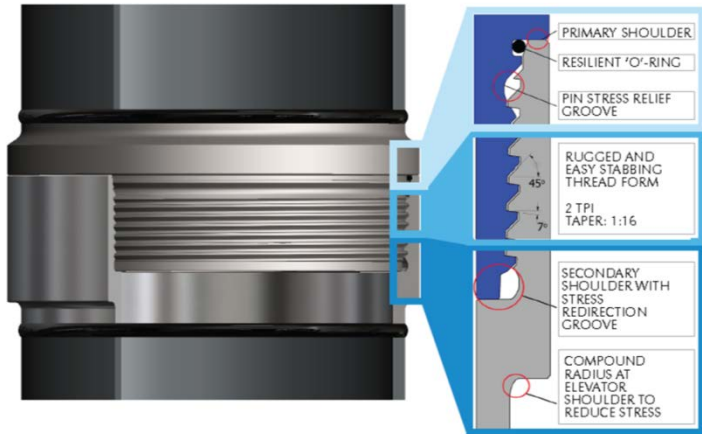


Surface wellhead components (spools, valves, studded cross, blind flanges, tree caps, etc.)





Premium Surface Casing / Conductors 16" to 36"





Premium General spares and accessories



BOTTOM PLUG



TOP PLUG



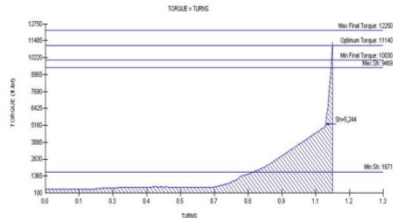


**Professional independent TPI services
witness & verification for inspection to relevant API, DS-1, NS-2, Premium OCTG standards**





Professional independent TPI services witness & verification of manufacture / assembly hold points to QCP (Quality Control Plan)



QUALITY CONTROL PLAN					QCP No. 001	Rev. No. 0	
Oilfield Connect					Approved:	Customer:	Date:
VAM® 21 PIN CONNECTION THREADING & MANGANESE PHOSPHATING					Facility:		Date:
ELEMENT NUMBER	PROCESS	PROCEDURE (Mfg#)	DESCRIPTION OF ACTIVITY	ACCEPTANCE CRITERIA CRITICAL VARIABLES	QUALITY RECORD	INSPECTION REQUIREMENT	
						Mfg#	Clot
1	Capability and equipment verification	???????	Verify license & qualification, technical details of scope. Check availability of machine, tooling, measuring gauges, overlays, CNC program, swage jaws, makeup jaws, setting masters, etc.	License and qualification are current. All Measuring instruments shall be within the calibration frequency and suitable to use	License certification Gauge calibration masterlist	DR/V	DR
Notes: VAM Ref document: TSL1 215 Rev02 Contract Review and Records							
2	Sales Order Contract Review	???????	Review customer PO reference to OMS issued Quote, and Sales Order	PO matches OMS Quote and Sales Order Quantities, prices, technical descriptions are correct.	Sales Order & Roster documentation	DR	DR
Notes: VAM Ref document: TSL1 215 Rev02 Contract Review and Records							
3	Receive Material / Receiving Inspection	???????	Receive and verify material received matches sales order	Material is as stated on the Sales Order / Production Work Order, and is undamaged, record heat #, and in good order.	Receiving Inspection Report	DR	



Oilfield Connect Presentation

To the

Hydraulic Fracturing of Onshore Unconventional Reservoirs in the Northern Territory.

01-August 2017

Key topics

- The use of 'heard effect' on the public to sway opinion.
- Climate Change ... or is it?
- Well integrity misinformation 101
- Economists say no jobs, environmentalists claim job losses

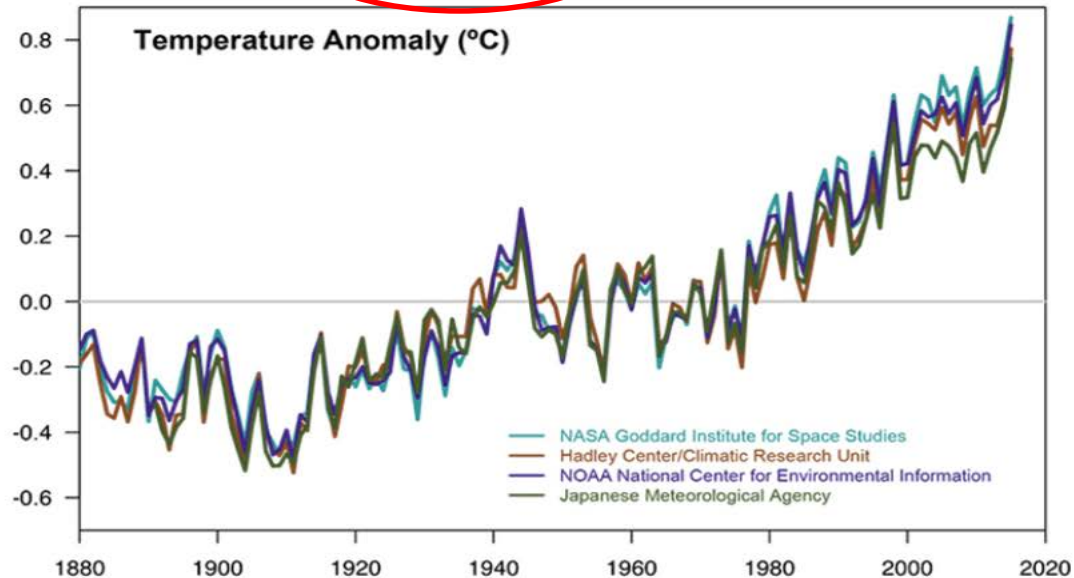
**The use of 'heard effect' on
the public to sway opinion.**

The use of 'heard effect' on the public to sway opinion.

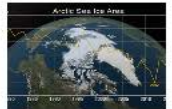




Scientific consensus: Earth's climate is warming



Latest res



Multiple studies published in peer-reviewed scientific journals¹ show that 97 percent or more of actively publishing climate scientists agree: Climate-warming trends over the past century are extremely likely due to human activities. In addition, most of the leading scientific organizations worldwide have issued public statements endorsing this position. The following is a partial list of these organizations, along with links to their published statements and a selection of related resources.

97.1% Where does this number come from ?

Bedford and Cook

(Sci Educ 22:2019–2030, 2013)

(Surveys of scientists' views on climate change - with a focus on human-caused or anthropogenic global warming (AGW) - have been undertaken since the 1990s.[1] A 2016 paper (which was co-authored by Naomi Oreskes, Peter Doran, William Anderegg, Bart Verheggen, Ed Maibach, J. Stuart Carlton and John Cook, and which was based on a half a dozen independent studies by the authors) concluded that “the finding of 97% consensus [that humans are causing recent global warming] in published climate research is robust and consistent with other surveys of climate scientists and peer-reviewed studies.”)

https://en.wikipedia.org/wiki/Surveys_of_scientists%27_views_on_climate_change

Bedford and Cook

(Sci Educ 22:2019–2030, 2013)

*(Cook et al. examined 11,944 abstracts from the peer-reviewed scientific literature from 1991–2011 that matched the topics 'global climate change' or 'global warming'. They found that, **while 66.4% of them expressed no position on anthropogenic global warming (AGW), of those that did, 97.1% endorsed the consensus position that humans are contributing to global warming.**)*

... This would mean that only 33.6% had any position at all on AGW and of those he says 97.1% endorsed that AGW 'contributed' to GW ... but it also fails to address the degree of AGW contribution

https://en.wikipedia.org/wiki/Surveys_of_scientists%27_views_on_climate_change

Definitions of 'Consensus' Cook et al. (2013)

Unquantified definition of consensus

"Humans are causing some global warming"

Standard (quantified) definition of consensus

*"Human activity is very likely causing **MOST** of the **CURRENT** warming"*

(Anthropogenic Global Warming or AGW)

Catastrophist definition of consensus

*"Human influence is **DANGEROUS** enough to justify a 'Climate Policy'"*

Debunked the claim of 'Consensus' - D. R. Legates et al. (2013)

Climate Consensus and 'Misinformation':

A Rejoinder to Agnotology, Scientific Consensus, and the Teaching and Learning of Climate Change

David R. Legates • Willie Soon • William M. Briggs • Christopher Monckton of Brenchley

Sci & Educ DOI 10.1007/s11191-013-9647-9

Debunked the claim of 'Consensus' - D. R. Legates et al. (2013)

*The claimed 'Scientific Consensus' states that "Human activity is very likely causing **MOST** of the **CURRENT** Global Warming" (Anthropogenic Global Warming or AGW)*

# reports	description	%
11,944	Total abstracts reviewed	100%
~~7,930~~	Were excluded for expressing no opinion	~~66.4%~~
3,896	'marked' as agreeing humans cause some climate warming	32.6
64	'marked' as endorsing consensus as defined	0.5%
41	'actually' endorsing consensus as defined	0.3%
0	'marked' as endorsing manmade catastrophe	0%



Page 7 ... email from Joe Alcamo, Director of the Center for Environmental Systems Research in Germany, to Mike Hulme and Rob Swart:

I am very strongly in favor of as wide and rapid a distribution as possible for endorsements. I think the only thing that counts is numbers. The media is going to say "1000 scientists signed" or "1500 signed". No one is going to check if it is 600 with PhDs versus 2000 without. They will mention the prominent ones, but that is a different story.

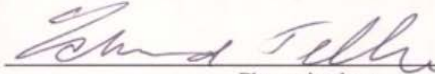
<http://www.lavoisier.com.au/articles/greenhouse-science/climate-change/climategate-emails.pdf>

***31,487 American scientists have signed this petition
including 9,029 with PhDs***

Petition

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth.



Please sign here

☒ Please send more petition cards for me to distribute.

My academic degree is B.S. ☐ M.S. ☐ Ph.D. ☒ in the field of PHYSICS

<http://www.petitionproject.org/>

Petition

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

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<http://www.petitionproject.org/>

**Be weary of anyone holding
up a sign that says that they
have “95% - 100% consensus
on anything”**



95%
LOCALS SURVEYED

Climate Change, or is it?

- **Climate Warming** – a continuous warming trend
- **Climate Cooling** – a continuous cooling trend
- **Climate Change** - oscillation between warmer & cooler
- **Climate Pause** – no oscillation between warmer & cooler

Climate Warming ≠ Climate Change

Anthropogenic Global Warming (AGW)

Climate alarmists believe that Anthropogenic Global Warming (AGW) is the dominant “climate driver” for the current Climate Warming (CW).

Due to their perceived ‘consensus’ ... anyone who doesn’t subscribe to this same belief is labelled as a ‘Climate Change Sceptic’ or a “Climate Change Denier”, and this term is meant in as a derogatory way.

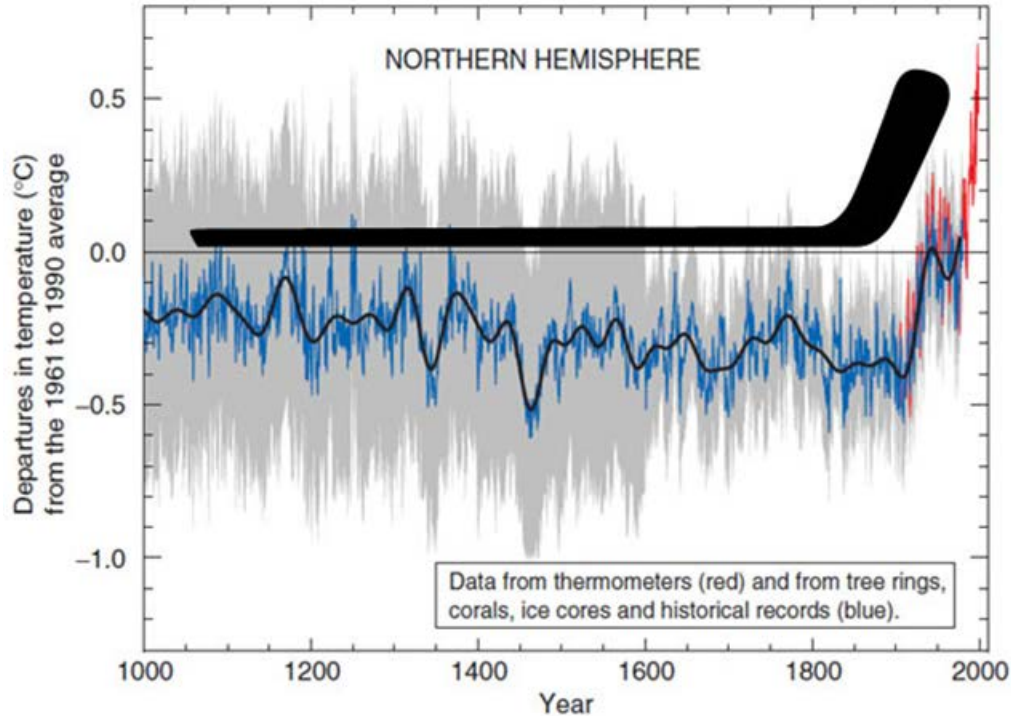
Anthropogenic Global Warming (AGW)

So why do so many scientists not subscribe to the belief that Anthropogenic Global Warming (AGW) is the dominant “climate driver” for the current Climate Warming (CW)?

There are two parts to this question:

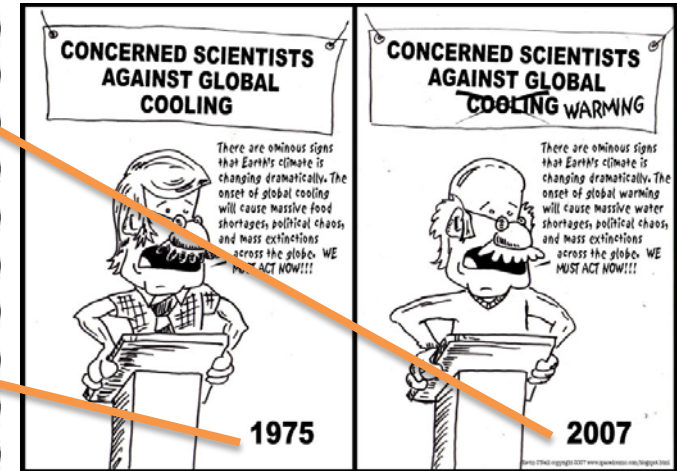
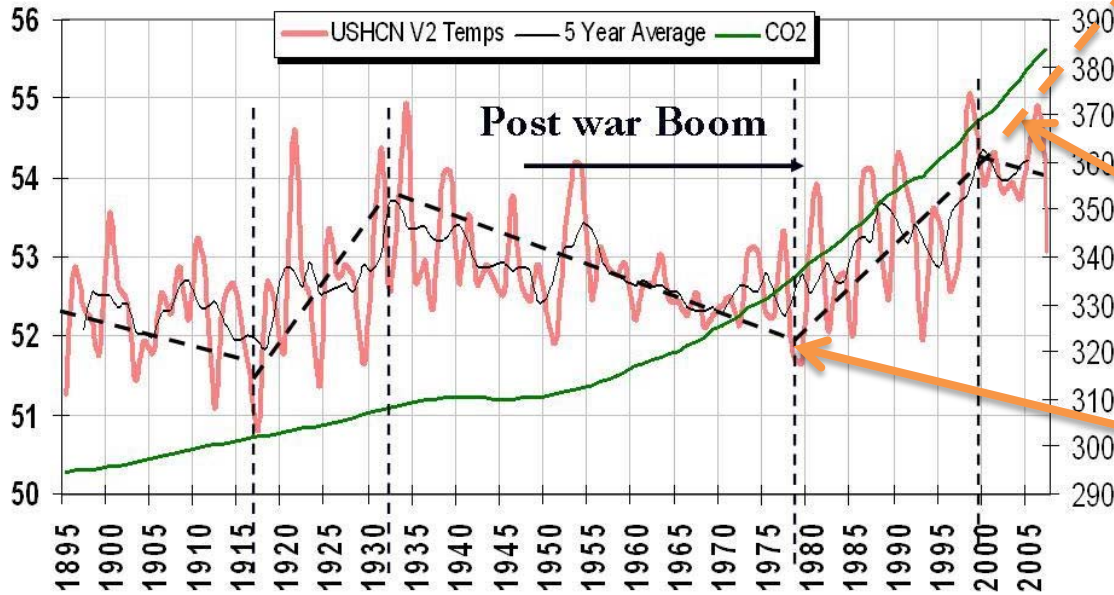
- What drives Climate Change?**
- Is the Climate actually warming at all?**

Alarm (AGW) ahead !!!



Alarm (AGW) ahead !!!

Annual CO2 versus USHCN V2 Temps



One-third of Man's entire influence on climate since the Industrial Revolution has occurred since January 1997. Yet **for 224 months** since then there has been no global warming at all (Fig. 1). With this month's RSS temperature record, **the Pause** sets a new record at **18 years 8 months**.



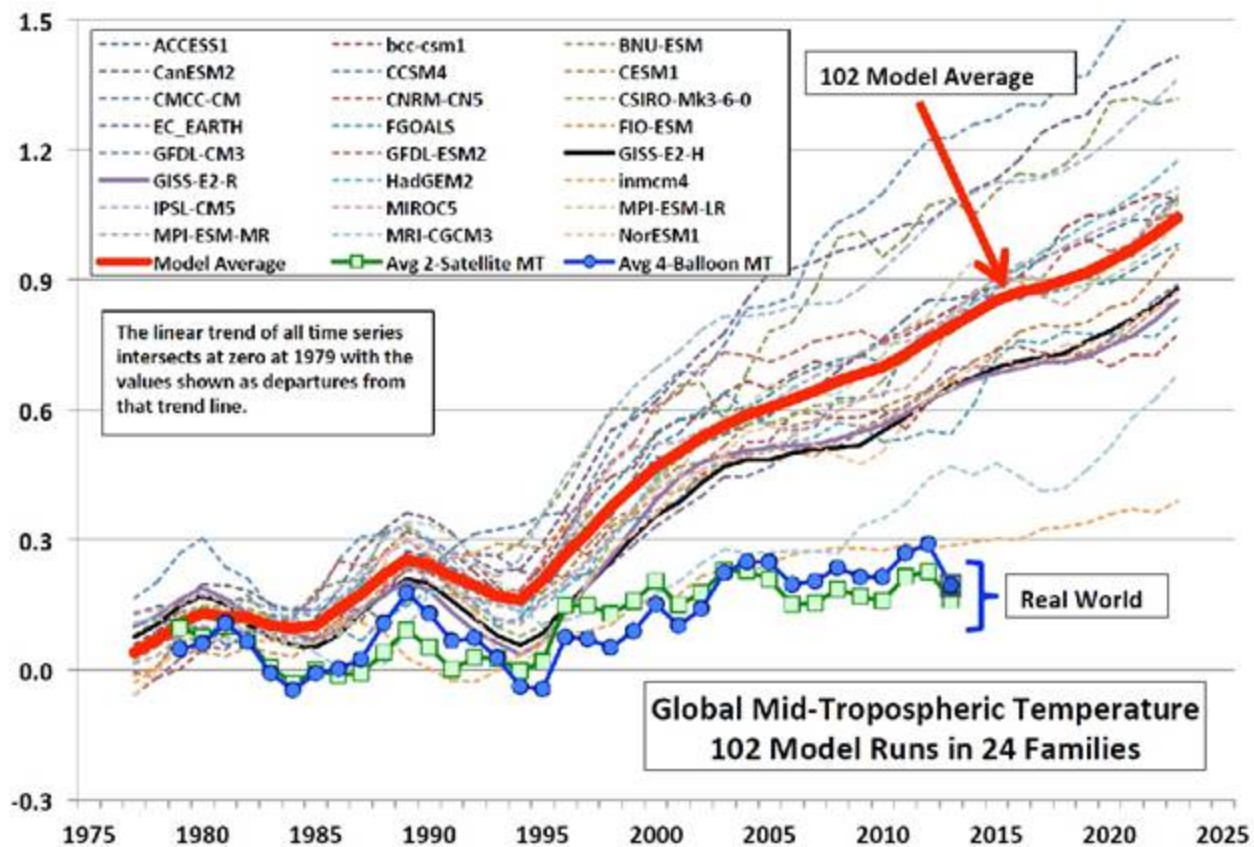
**Jan 1997 –
Aug 2017**

20 Y – 7 M

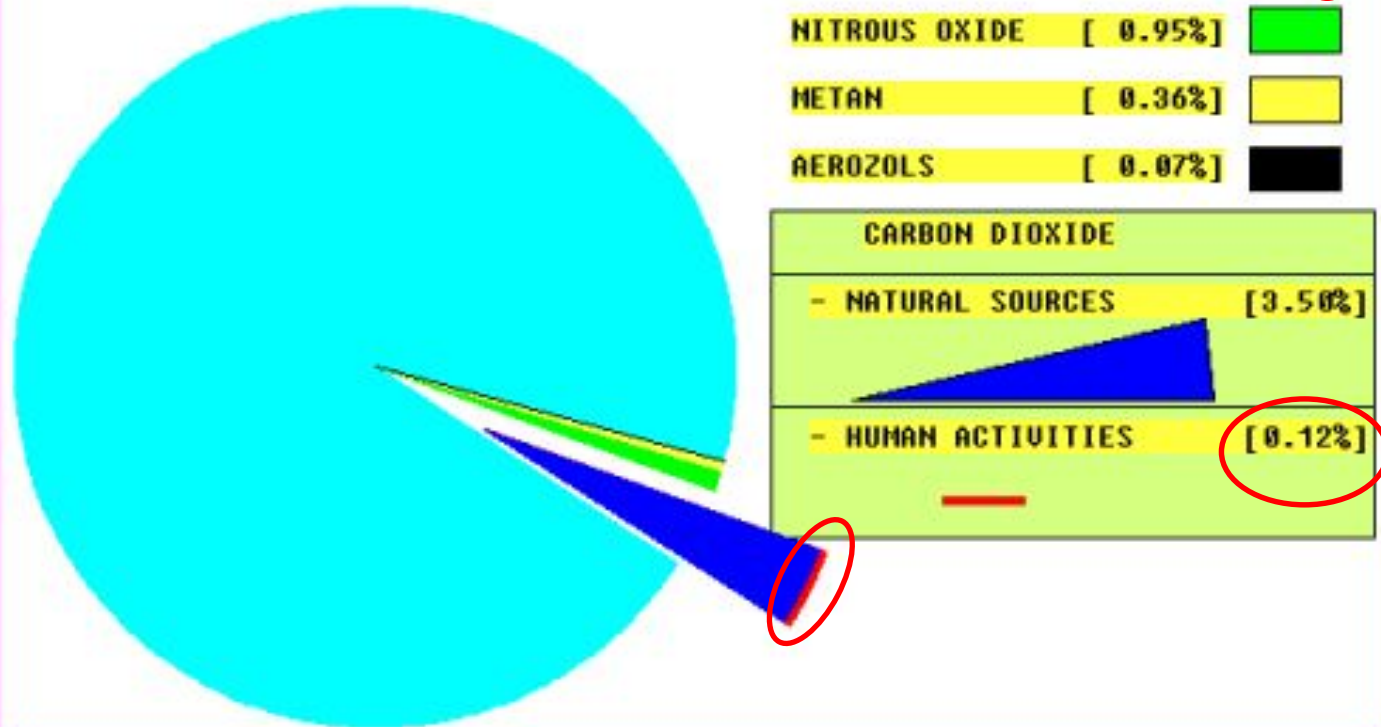
247 Months

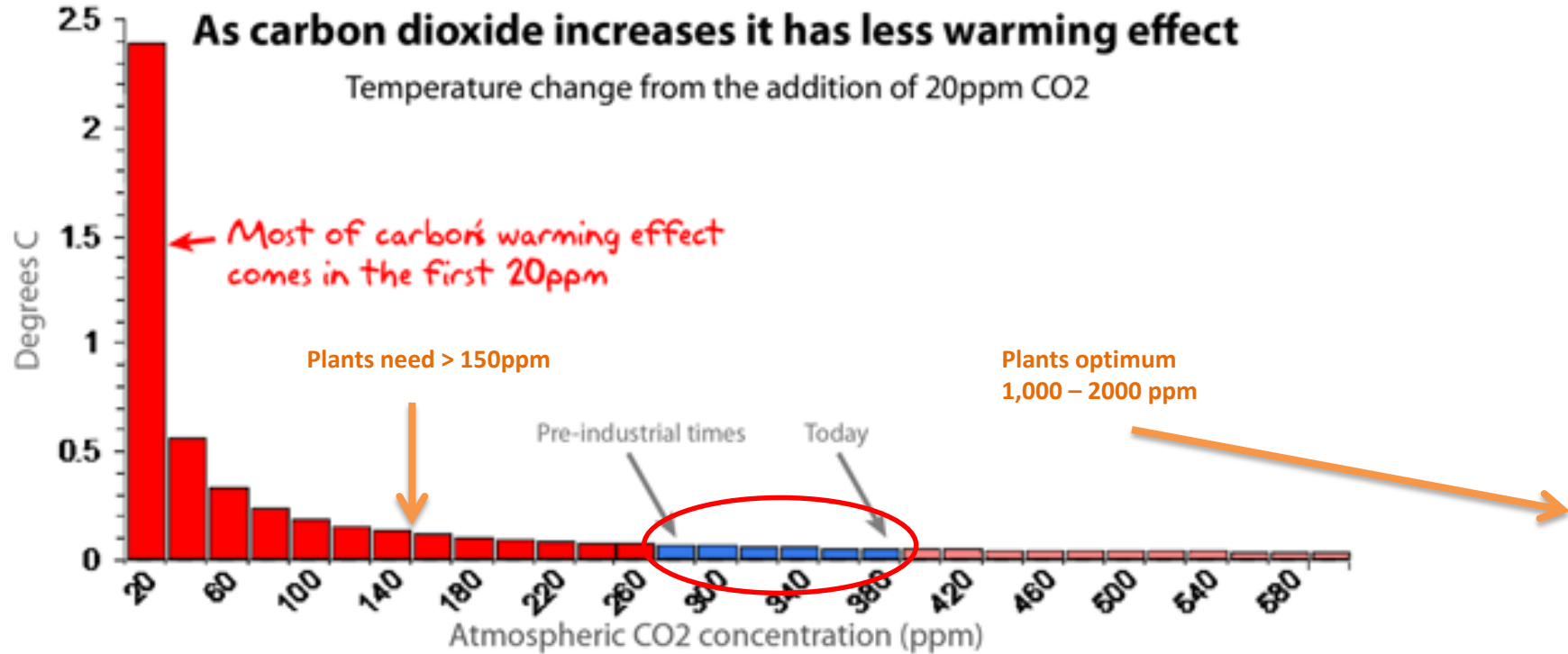
Climate Pause

- The IPCC recognises that the global warming 'pause' first reported in 2012 is real and they concede that their computer models did not predict it.
- They cannot explain why world average temperatures have not shown any statistically significant increase since 1997.
- They admit large parts of the world were as warm as they are now for decades at a time between 950 and 1250 AD – centuries before the Industrial Revolution, and when the population and CO2 levels were both much lower.

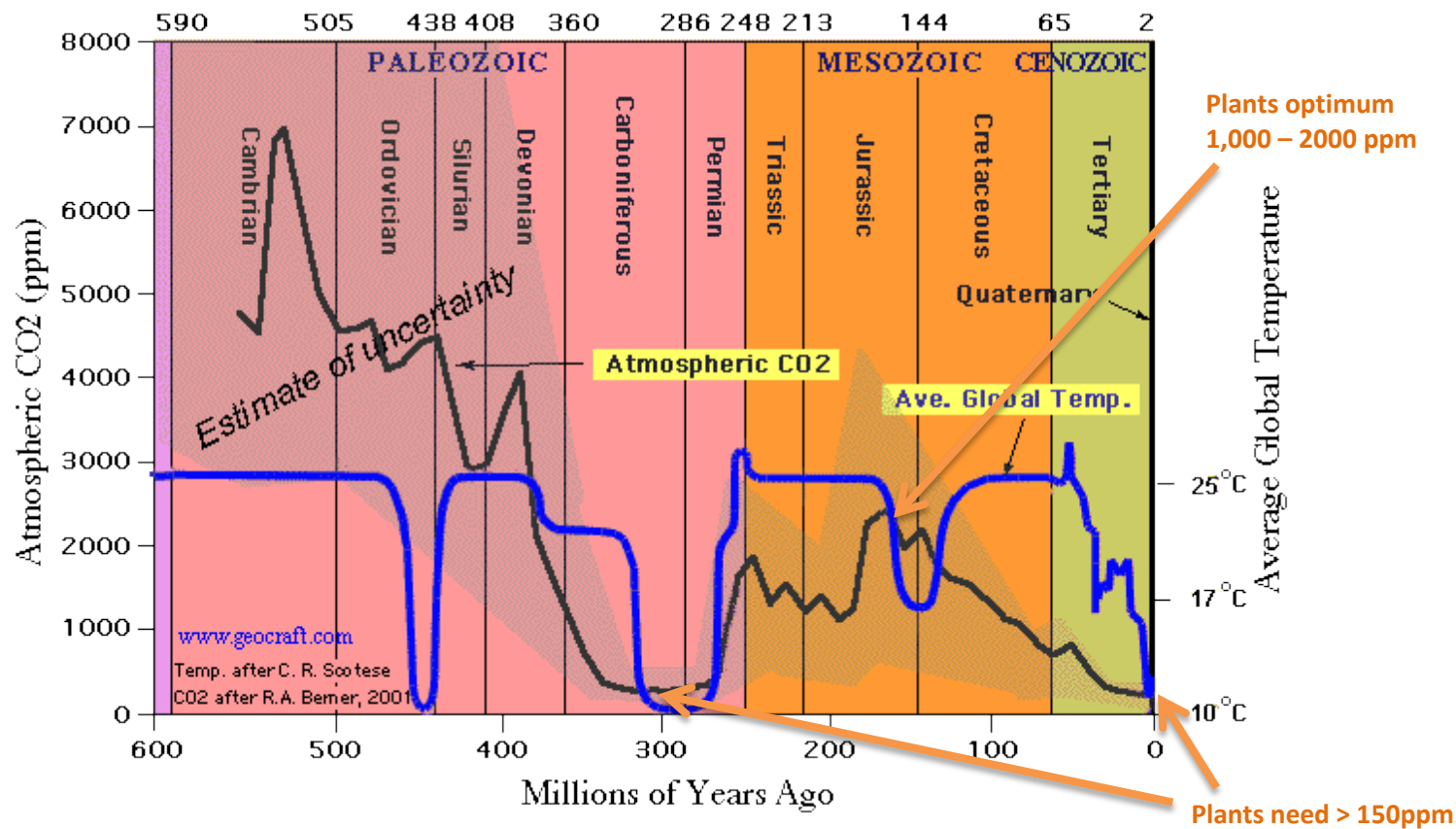


GLASS-HOUSE GASES IN GLOBAL WARMING EFFECT





* Assumes a climate sensitivity of 0.15°C/W/m² following Lindzen and Choi, 2009



Well integrity misinformation

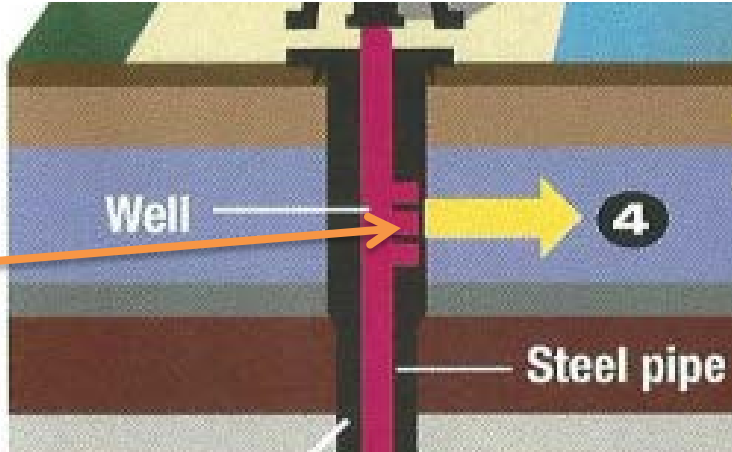
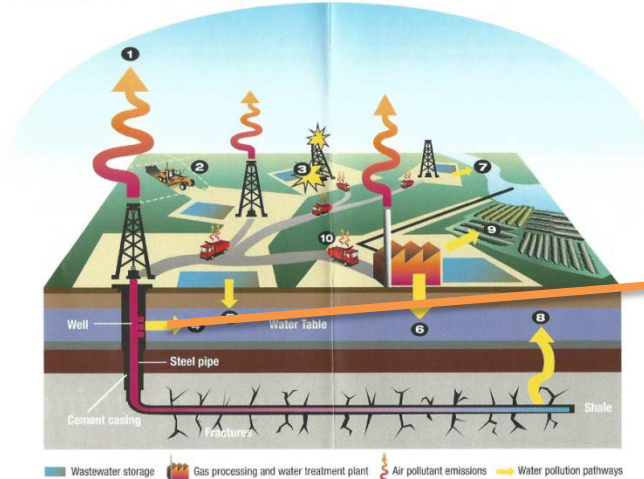
This is what is used to scare people

Impacts of unconventional gas operations:

- 1 Air pollution from a wide range of hazardous air pollutants released from wells and infrastructure.
- 2 Loss of large areas of farmland & bushland for well pads, pipelines & roads.
- 3 Fugitive emissions from leaks in wells, pipes & infrastructure.
- 4 Contamination of underground water resources due to well casing failure.
- 5 Soil & water pollution from spills, leakage & overflow of toxic wastewater.
- 6 Soil & groundwater contamination from reinjection of poorly treated or untreated wastewater.
- 7 Pollution of waterways from wastewater & chemical spills and release of poorly treated wastewater.
- 8 Migration of gas and toxic substances into groundwater through natural faults and fracking induced pathways.
- 9 Water, soil and crop contamination from reuse of poorly treated or untreated wastewater on farmland.
- 10 Noise & air pollution from trucks, drill rigs and machinery.

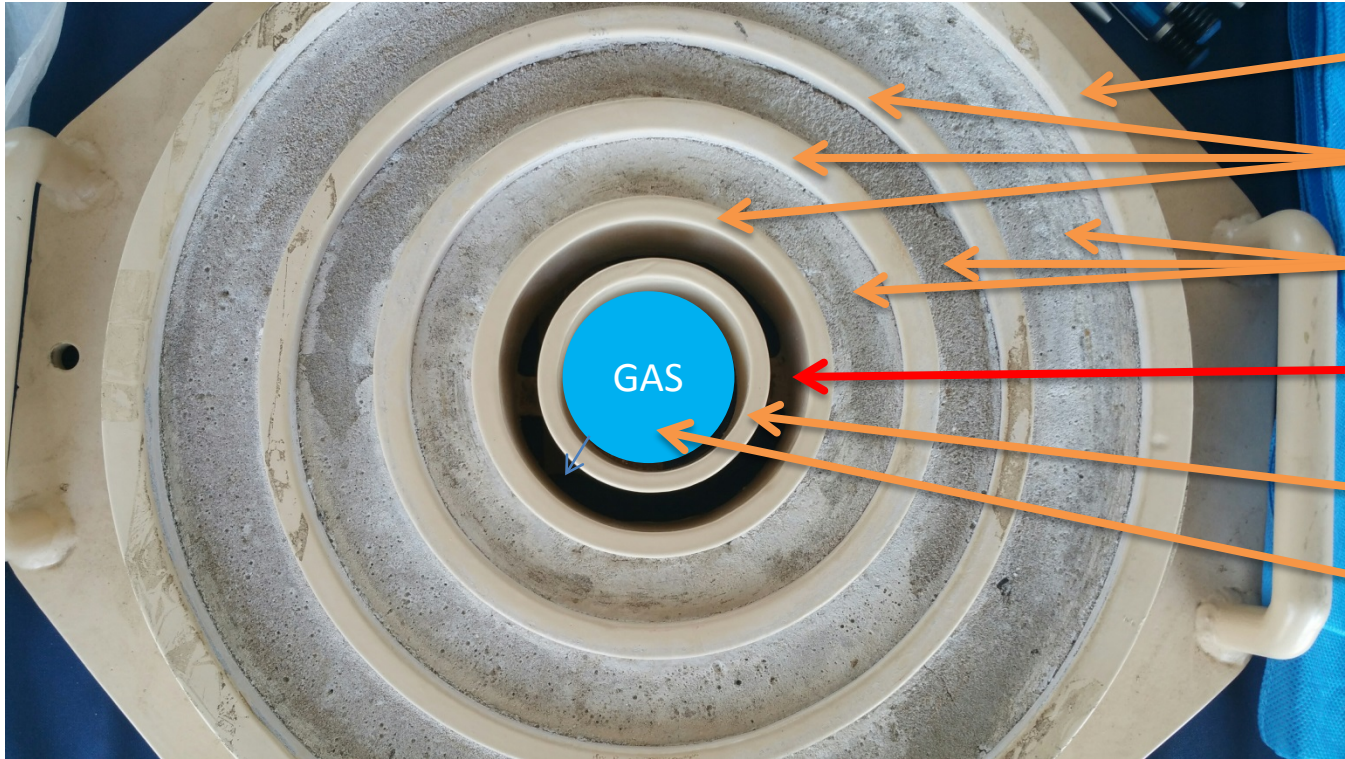


4 Contamination of underground water resources due to well casing failure.



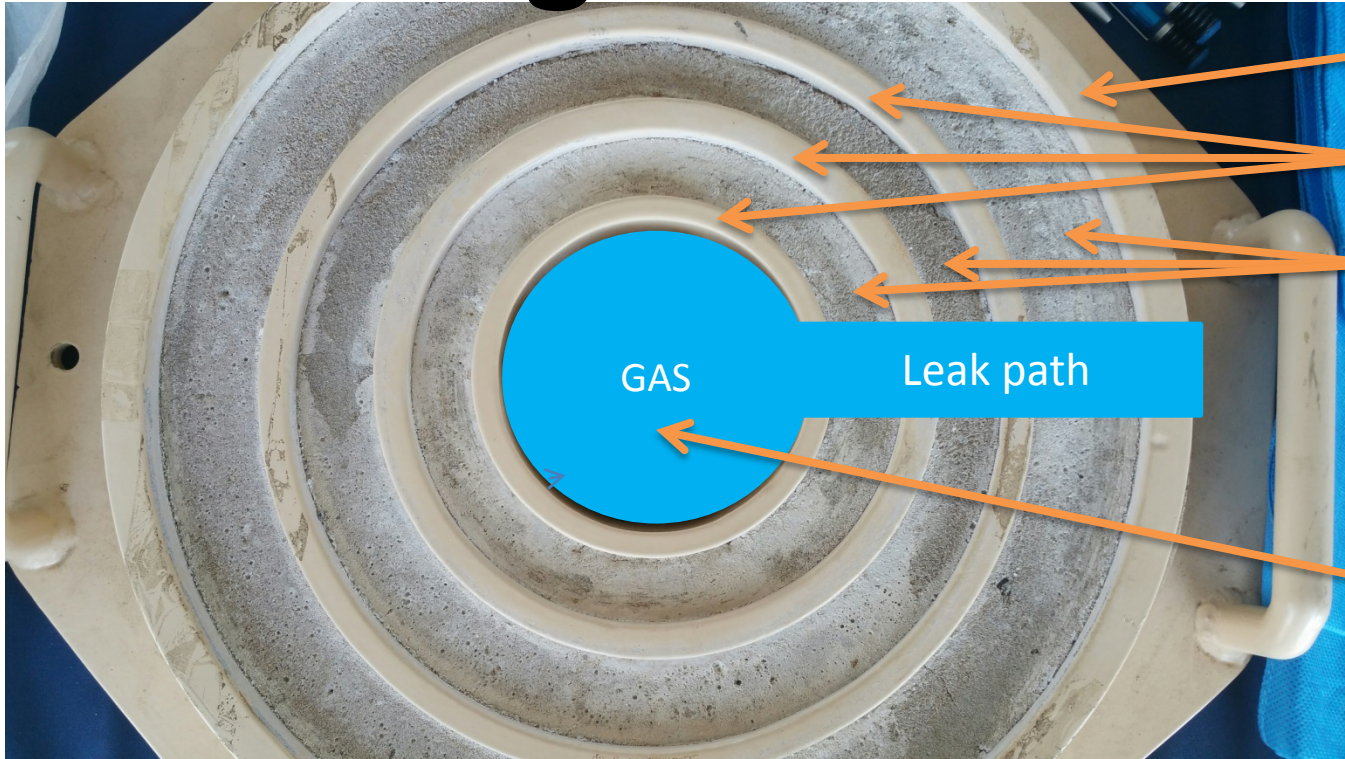
*Graphic adapted from: Gas fracking: Can we safely squeeze the rocks? UNEP/GEAS, 2012.

Cross section of an O&G well



- Conductor
- Casing (API 5CT)
(3x Secondary boundary)
- Cement(special)
(3x Secondary boundary)
- **Annulus (void)**
- Tubing (API 5CT)
(Primary boundary)
- Natural Gas

LTGA image of leak into aquifer



- Conductor
- Casing (API 5CT)
(3x Secondary boundary)
- Cement(special)
(3x Secondary boundary)
- ~~Annulus (void)~~
- ~~Tubing (API 5CT)~~
(Primary boundary)
- Natural Gas

Workover rig replaces tubing



- Kill the well – stops the production flow
- Removes the used production tubing
- Installs new production tubing
- Check for tubing integrity
- Re-flow the well



LTGA claims >6% wells fail

- If you send your car to a mechanic workshop to check the brakes and they measure the thickness of the brake pads against the manufacturers specifications for acceptable wear ... and the brake pads are found to be worn below acceptable measurements ... and the mechanic replaces the worn brake pads with new brake pads ... would you call this a 'brake failure' or would you call this 'proactive or scheduled maintenance'?
- So if you perform a periodic inspection on the production tubing condition, and it is deemed to be outside acceptable serviceable specifications ... and you replace the tubing with a new production tubing string ... would you call that a 'well failure' or would you call this 'proactive or scheduled maintenance'?

Economists say no new jobs will be created, & environmentalists claim - many jobs will 'possibly' be lost

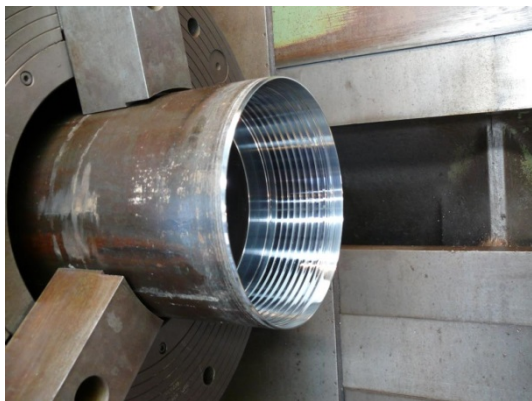














Most premium thread qualifications in Australia

[illegible]

Questions for those who supported a moratorium

- In a post-moratorium era, who will pay to rebuild the local SME service businesses to support operations?
- Who's will be responsible for reinstating service capabilities of these SME's back to their pre-moratorium levels?
- Who's will take responsibility for reskilling a workforce in industry standards now that decades of experience is lost?
- Who will compensate the workers who were suddenly made redundant and were unemployed and unassisted for up to a year, some still seeking suitable work today?

Thank you



OCTG and Well Integrity

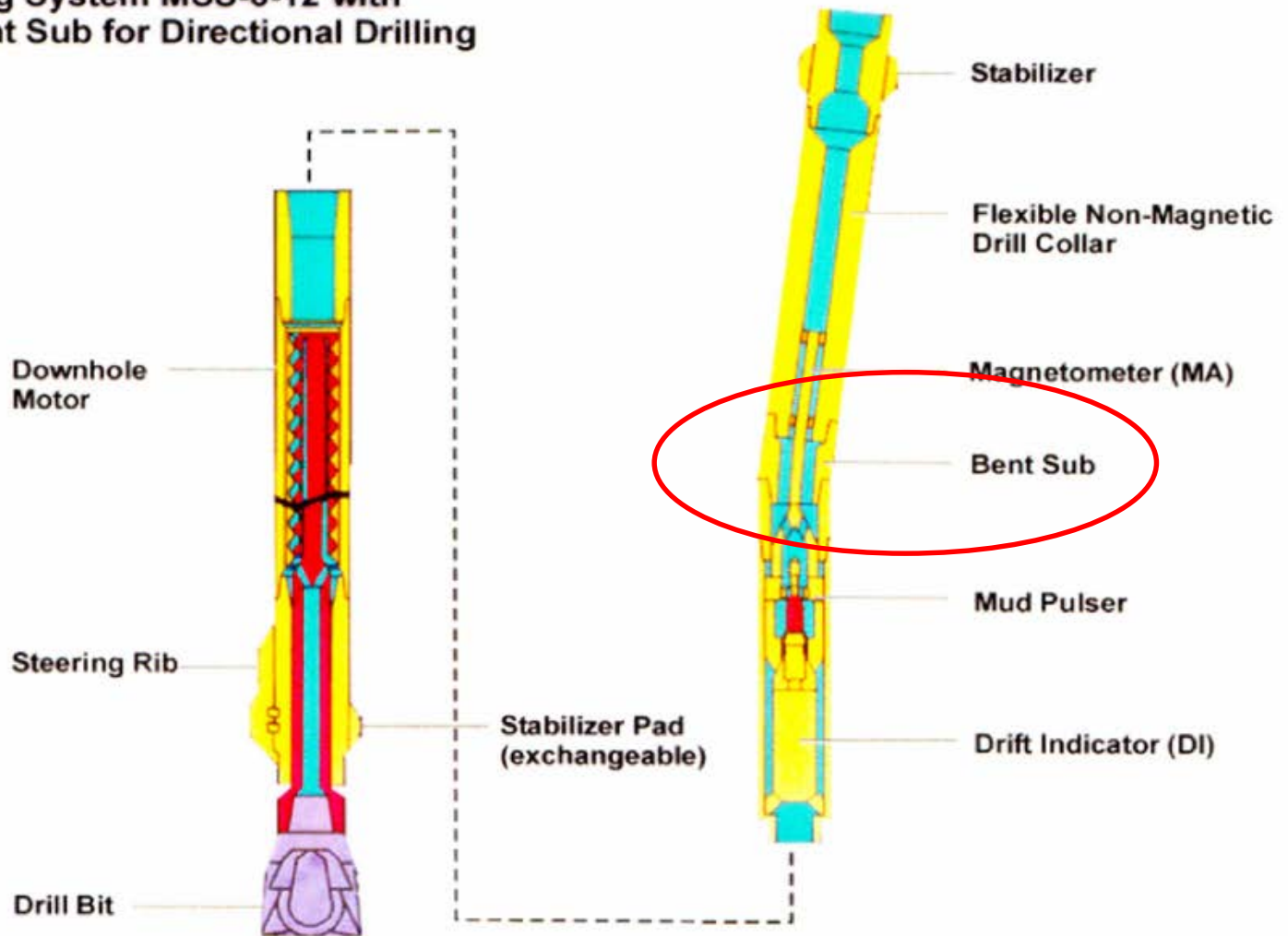
Disclaimer:

The material in this presentation has been prepared by Mark Fraser and is provided as general background information only, relevant to the manufacture, inspection, repair and modification of OCTG and Drill String products and how these relate to Well Integrity.

This information is given in summary form only, as some technical data too voluminous in content and/or is subject to confidentiality of various company's IP (Intellectual Property) and thus this information presentation does not purport to be complete in detail.

Direction Drilling

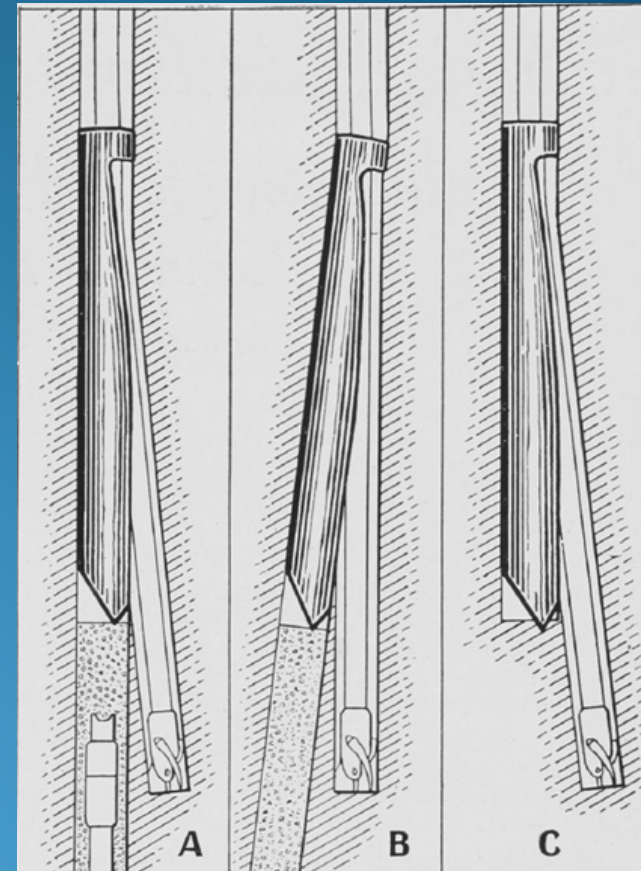
Motor Steering System MSS-6-12 with
DIMA and Bent Sub for Directional Drilling



Direction Drilling

Directional Drilling, is it a new technology ?

- Eastman Oil Well Survey Company achieved fame in 1934 by drilling one of the first controlled directional relief wells to intercept another well, using the Whipstock method.

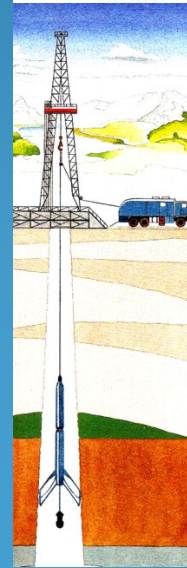
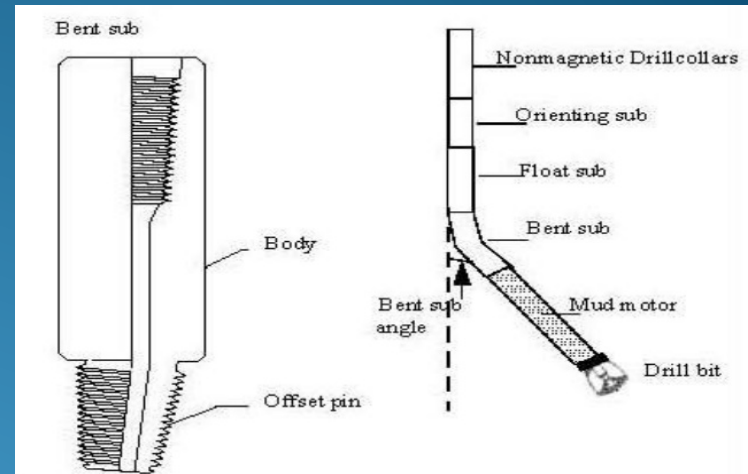


Three uses of the directional whipstock.—
A. To deflect the bore past an obstruction.
B. To straighten a deflected bore.
C. To deflect the bore in a required direction.

Direction Drilling

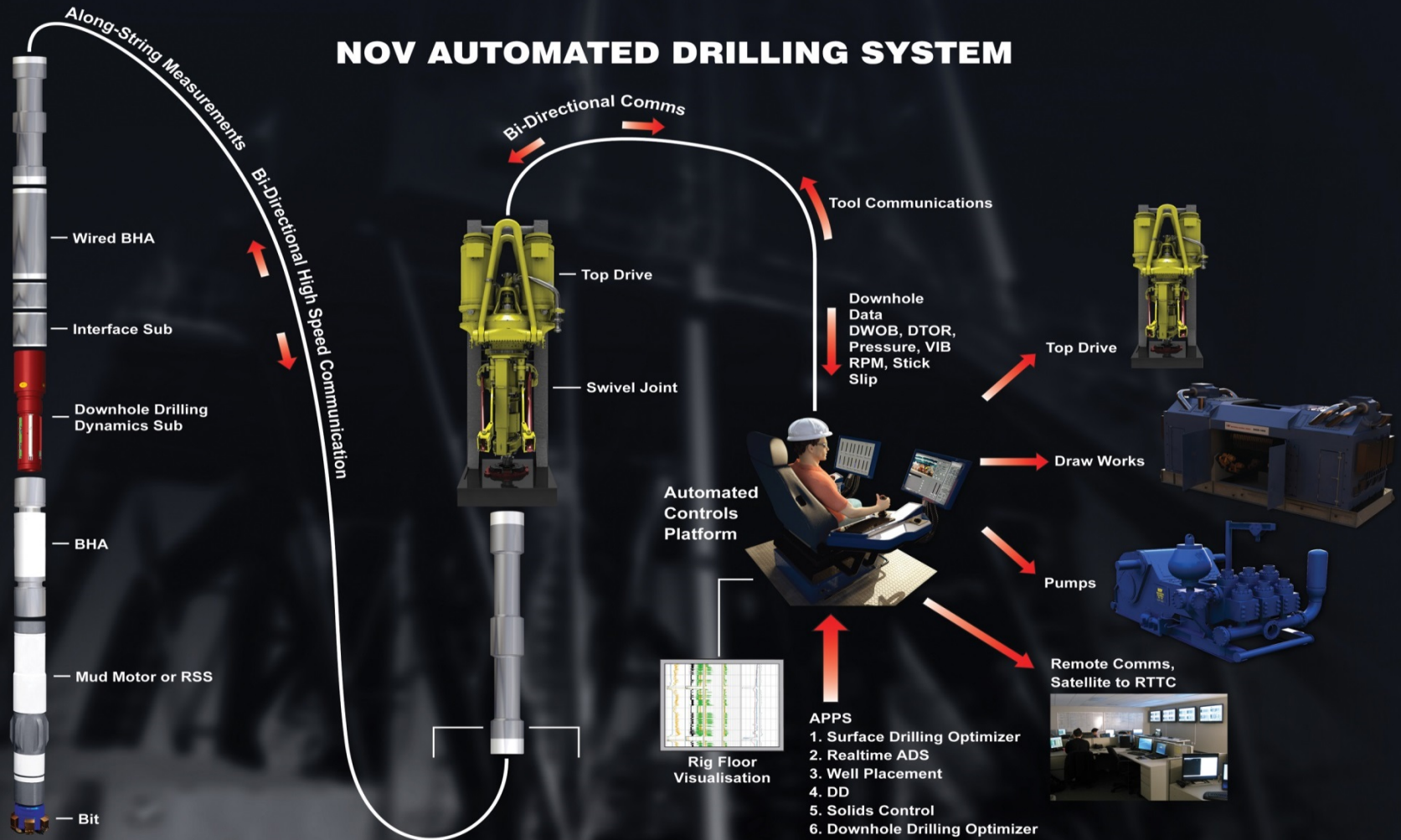
Directional Drilling the **OLD** way:

- Drill straight down to the kick-off point
- Pull Out (trip out)
- Change the straight BHA (Bottom Hole Assembly) with Bent Sub & Mud Motor & Bit
- Orientate the bend in desired direction
- Go back in (trip in)
- Drill with only the Mud Motor rotating Bit
- Well will arc in the orientated direction
- Trip out & remove the Bent Sub
- Run in logging tool to measure angle & depth
- If more direction (kick) required, repeat with Bent Sub & trip back in
- Else if OK, remove Bent Sub from BHA and continue drilling on new trajectory
- Repeat
- Repeat



Direction Drilling

NOV AUTOMATED DRILLING SYSTEM



Direction Drilling

Thank You
Questions ?

NEXT: OCTG and Well Integrity

OCTG and Well Integrity

Which independent body maintains 'Global Standards' to regulate Industries ?



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[ISO 27001](#) Information security management

[ISO 45001](#) Occupational health and safety

[ISO 37001](#) Anti bribery management systems

[ISO 13485](#) Medical devices

Are you looking to buy an ISO standard?

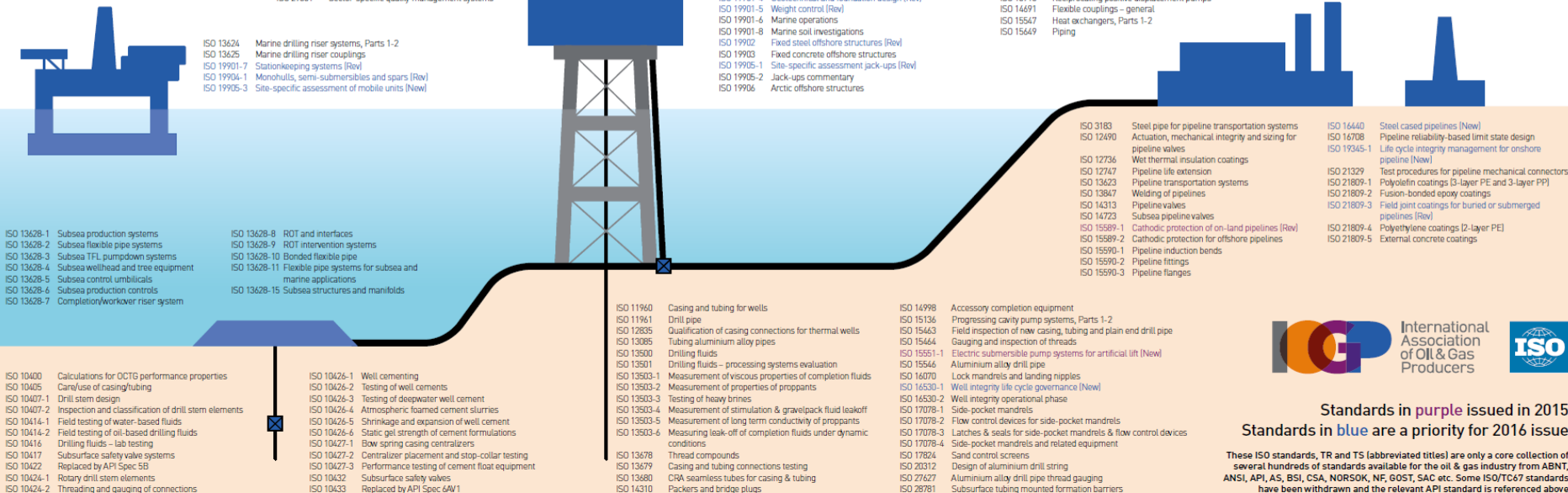
[Visit the ISO Store](#)

Which 'ISO' Standards are used to regulate the Oil & Gas Industry ?

These ISO standards, are only a core collection of several hundreds of

Thousands of standards are available for the oil & gas industry from:

ABNT, ANSI, API, AS, BSI, CSA, Norsok, NE, GOST, SAC, etc.



Standards in **purple** issued in 2015
Standards in **blue** are a priority for 2016 issue

These ISO standards, TR and TS (abbreviated titles) are only a core collection of several hundreds of standards available for the oil & gas industry from ABNT, ANSI, API, AS, BSI, CSA, NORSOK, NF, GOST, SAC etc. Some ISO/TC67 standards have been withdrawn and the relevant API standard is referenced above

OCTG and Well Integrity

What is OCTG?

OCTG = Oil Country Tubular Goods



- This refers to any '**Casing**' or '**Tubing**' that forms part of the well bore.
- Any special components used in the well bore are usually referred to as '**Accessories**'
- The key applicable **API** (American Petroleum Institute) standards are ~ API 5CT, API 5C1, API 5B, API 5B1, API 5A5 and API 5L (for line pipe)



OCTG and Well Integrity

What are the API standards ... API 5CT and API 5B used for ?

- API 5CT and API 5B are the main industry standards used every day for the manufacture and repair of API OCTG, however it doesn't limit OEM's (Original Equipment Manufacturers) from innovation to enhance, such as in the proprietary design of Premium Connections for gas application.

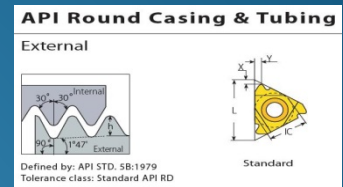
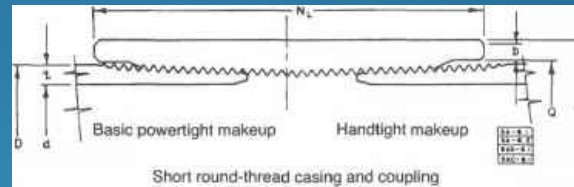


OCTG and Well Integrity

What threads does API 5CT cover ?

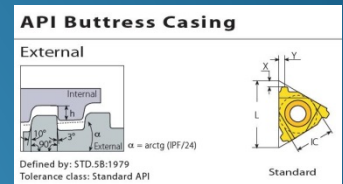
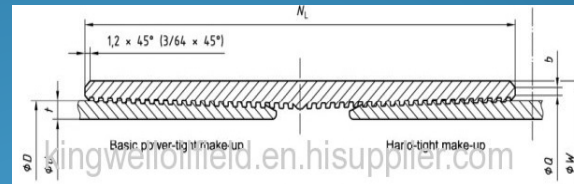
Casing:

- short round thread casing (STC);
- long round thread casing (LTC);



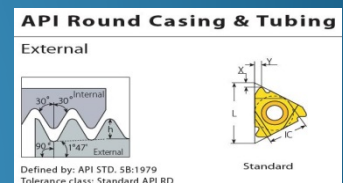
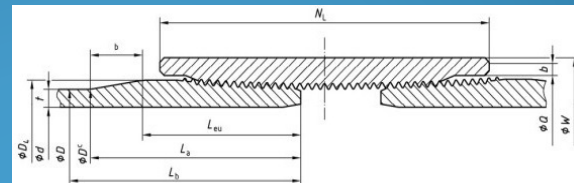
Casing:

- buttress thread casing (BTC);



Tubing:

- non-upset tubing (NU);
- external upset tubing (EU);

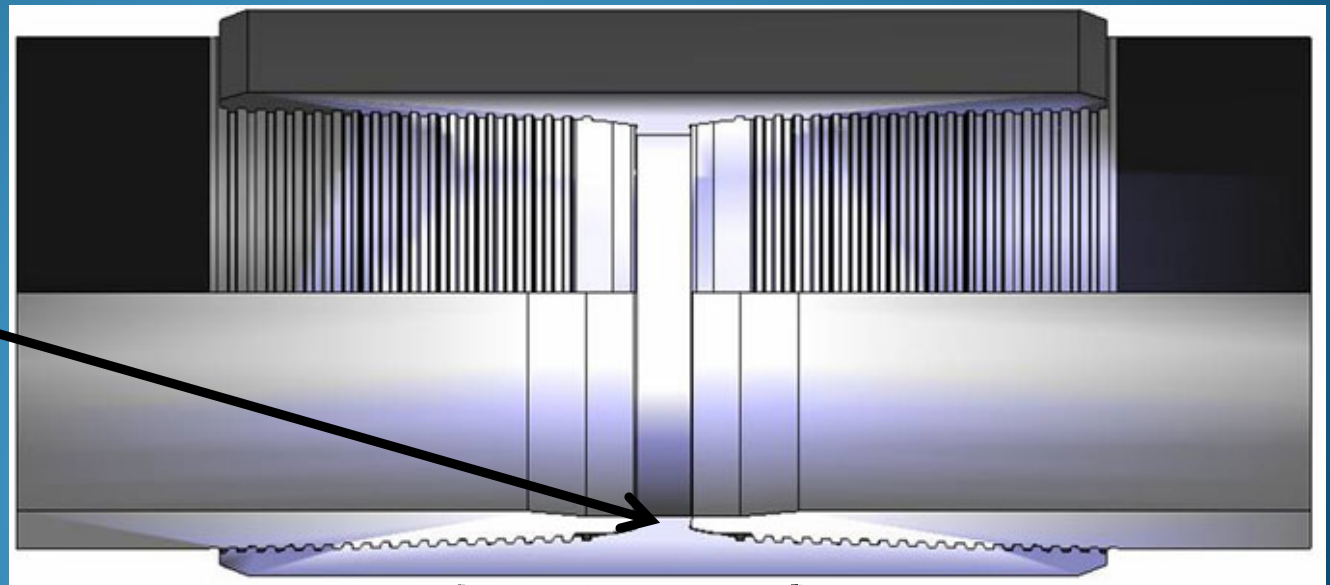


OCTG and Well Integrity

What are Premium Threads ?

- Originally faced with the problem, that the API threads were OK for Crude Oil, however not very suitable for Gas, and so OCTG machine shops began to develop modified versions of the API threads, with an integral Gas seal area and began to patent their unique designs.

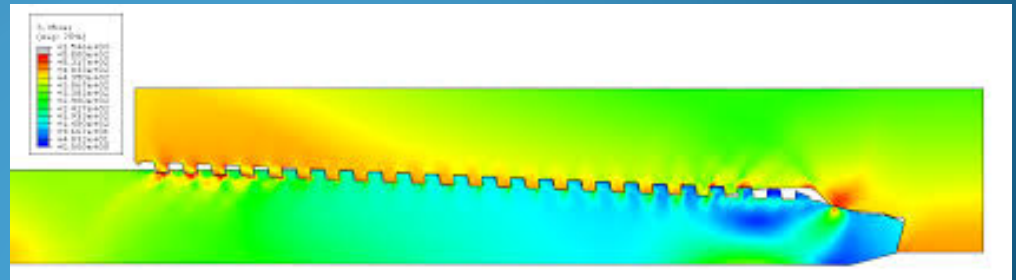
NO GAS SEAL



OCTG and Well Integrity

What is involved in the design of Premium Threads?

- Premium Threads are designed by engineers
- They usually have a Gas seal area
- They are patented and thus have IP protection
- They go through extensive desktop FEA analysis
- They go through rigorous mechanical testing to test performance such as:
 - Minimum Yield Strength of the thread
 - Burst Pressure
 - Collapse pressure
 - Bending motion, while maintaining seal integrity
 - Fatigue and vibration
 - etc.



OCTG and Well Integrity

Who designs these Premium Threads ?

- Today, many of the original patented designs IP, have been acquired by the major steel mills, where they have 'cutting edge' R&D departments continually developing and improving the existing designs and/or developing totally new designs, as the demands for deeper and more complex wells increase.

- These include:

- TenarisHydril
- VAM Services
- JFECT
- NS Connections
- Hunting Energy
- Metal One
- Many others



OCTG and Well Integrity

Give me some names of different Premium Threads ?

- TenarisHydril:
 - TSH BLUE; TSH BLUE TL; TSH 523; TSH 521; TSH 513; TSH 511; TSH 563; TSH 561; TSH ER; TSH MS; TSH MS XT/XC; TSH MS 28; TSH MS XT/XC 28; TSH CS; TSH PH4; TSH PH6; AB HD-L; TSH 3SB Tubing; TSH 3SB Casing; TSH 3SB NEW; TSH 3SB-ST.
- VAM Services:
 - VAM 21; VAM 21HT; DINO VAM; VAM TOP; VAM TOP HT; VAM TOP HC; VAM FJL; VAM ACE; VAM SLIJ-II, VAM HTTC, VAM HTF-NR, VAM TOP FE, VAM TOP KS, VAM TOP ND, VAM BOLT, BIG OMEGA.
- JFECT:
 - JFE FOX; JFE BEAR, JFE LION, JFE TIGER, CLEAR-RUN.
- NS CONNECTIONS:
 - NSCT; NSCC.
- METAL ONE:
 - SUPER MAX; FLUSHMAX, INTEGMAX, GEOCONN, MO-EUE-PA.

OCTG and Well Integrity

What are the types of Premium Threads options ?

- Each OEM / Licenser has their own set of designs, each having their own unique features.
 - The operator chooses a design based on their application, and the performance of the thread
 - Some threads have variants, like:
 - VAM TOP
 - VAM TOP HT
 - VAM TOP HC

OD	Weight / Wall	Grade	Connection
7	29.00# / 0.408	L80 13Cr	Select
			VAM® 21
			VAM® 21 HT
			VAM® TOP Casing
			VAM® SLIJ-II
			VAM® HTTC
			VAM® HTF-NR
			VAM® FJL
			VAM® TOP HC
			VAM® TOP HT
			VAM® FJL-ND

PIPE SELECTION DATA			
Unit	USC unit	Language	English
Size	7.000	Wall	0.408 (29.00)
		(Weight:lbs/ft)	
Grade	Min. Wall		90.0 %
Connection	Thickness		
Coupling	Casing/Tubing		
Option			
Wedge 511™			
Wedge 513™			
Wedge 523™			
Wedge 533™			
Wedge 563™ Casing			
CS®			
SLX™			
3SB™ Casing			
Blue®			
Blue® Near Flush			
Blue® Thermal Liner			
Blue® Dopeless®			
Wedge 511™ Dopeless®			
Wedge 513™ Dopeless®			
Wedge 521™			
Wedge 521™ Dopeless®			
Wedge 523™ Dopeless®			
Wedge 533™ Dopeless®			
Wedge 553™			
Wedge 553™ Dopeless®			
Wedge 563™ Casing Dopeless®			
Wedge 563™ Tubing			
Wedge 563™ Tubing Dopeless®			

OCTG and Well Integrity

How do the engineers know if a Premium Thread is suitable ?

- OEM / Licensors publish the Premium Thread performance data

PIPE BODY DATA					
GEOMETRY					
Nominal OD	9.625 in.	Nominal Weight	53.50 lbs/ft	Standard Drift Diameter	8.379 in.
Nominal ID	8.535 in.	Wall Thickness	0.545 in.	Special Drift Diameter	8.500 in.
Plain End Weight	52.90 lbs/ft				
PERFORMANCE					
Body Yield Strength	1710 x 1000 lbs	Internal Yield	11210 psi	SMYS	110000 psi
Collapse	7950 psi				

BLUE® CONNECTION DATA					
GEOMETRY					
Connection OD		10.626 in.	Coupling Length		11.693 in.
Critical Section Area		15.547 sq. in.	Make-Up Loss		5.065 in.
			Threads per in.		4.00
PERFORMANCE					
Tension Efficiency		100 %	Joint Yield Strength		1710 x 1000 lbs
			Internal Pressure Capacity		11210 psi
Compression Efficiency		100 %	Compression Strength		1710 x 1000 lbs
			Bending		52 °/100 ft
External Pressure Capacity		7950 psi			

MAKE-UP TORQUES			
Minimum	23950 ft-lbs	Optimum	26610 ft-lbs
Maximum	29270 ft-lbs		

OPERATIONAL LIMIT TORQUES			
Operating Torque	58820 ft-lbs	Yield Torque	90490 ft-lbs

SHOULDER TORQUES			
Minimum	3990 ft-lbs	Maximum	22620 ft-lbs

BLANKING DIMENSIONS			
Blanking Dimensions			

Issued on: 11 May 2016

VAM 21

Connection Data Sheet

OD	Weight	Wall Th.	Grade	Alt. Drift	Connection
9 5/8 in.	53.50 lb/ft	0.545 in.	P110	8.500 in.	VAM® 21

PIPE PROPERTIES		CONNECTION PROPERTIES	
Nominal OD	9.625 in.	Connection Type	Premium T&C
Nominal ID	8.535 in.	Connection OD (nom)	10.542 in.
Nominal Cross Section Area	15.545 sq.in.	Connection ID (nom)	8.722 in.
Grade Type	API 5CT	Make-up Loss	5.378 in.
Min. Yield Strength	110 ksi	Coupling Length	12.756 in.
Max. Yield Strength	140 ksi	Critical Cross Section	15.547 sq.in.
Min. Ultimate Tensile Strength	125 ksi	Tension Efficiency	100 % of pipe
Minimum Wall Thickness	90.0 %	Compression Efficiency	100 % of pipe
		Internal Pressure Efficiency	100 % of pipe
		External Pressure Efficiency	100 % of pipe

CONNECTION PERFORMANCES		FIELD TORQUE VALUES	
Tensile Yield Strength	1710 kb	Min. Make-up torque	38300 ft.lb
Compression Resistance	1710 kb	Opt. Make-up torque	42500 ft.lb
Internal Yield Pressure	11210 psi	Max. Make-up torque	45000 ft.lb
External Pressure Resistance	7600 psi	Maximum Torque with Sealability	57500 ft.lb
Max. Bending with Sealability (CAL IV)	30 °/100 ft		
Max. Load on Coupling Face	1070 kb		

Connect with Confidence.

VAM® 21 is the latest generation of T&C premium connection introducing an innovative and revolutionary design. Confidence thanks to ISO 13079 CAL-IV compliance within the full pipe body envelope extends the opportunities for your well designs.

For products manufactured before 01/04/2016, couplings are 25 mm shorter than the value published in this datasheet

Do you need help on this product? - Remember no one knows VAM® like VAM

canada@vamfreeservice.com	usa@vamfreeservice.com	china@vamfreeservice.com
usa@vamfreeservice.com	dubai@vamfreeservice.com	bangalore@vamfreeservice.com
mexico@vamfreeservice.com	ngoria@vamfreeservice.com	australia@vamfreeservice.com
asia@vamfreeservice.com	engino@vamfreeservice.com	

Over 140 VAM® Specialists available worldwide 24/7 for Rig Site Assistance

Other Connection Data Sheets are available at www.vamfreeservice.com

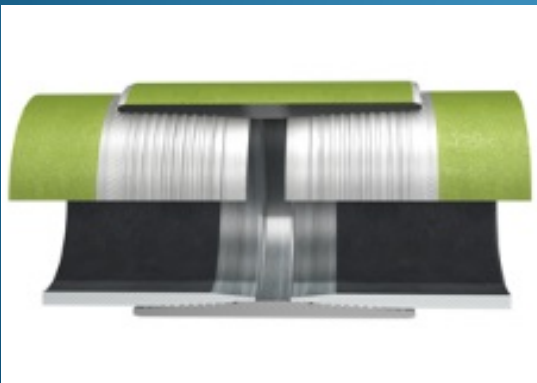
Vallourec Group

vallourec

OCTG and Well Integrity

Are there any significant differences in the designs of Premium Threads ?

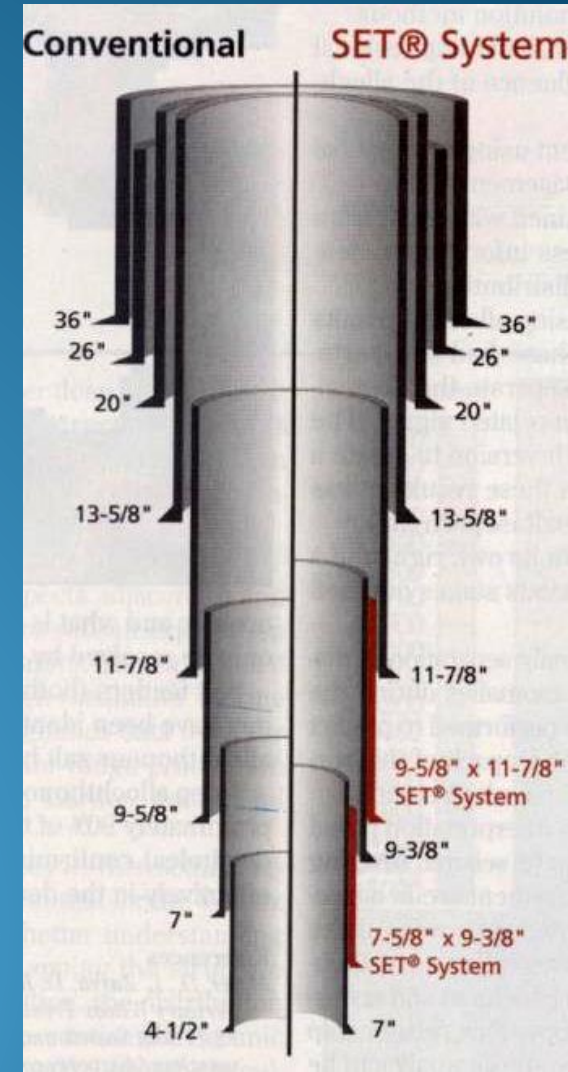
- YES!
- Each OEM / Licensor has a number of different designs.
- Some are special for certain applications.
- Some are old designs superseded with enhancements to make new designs.
- Some are custom designed to suit an Operators unique requirements.



OCTG and Well Integrity

What would be a special application for a Premium Thread ?

- The most common application would be coupled connections.
- However sometimes there is a need to run an extra string of casing in-between the standard casing sizes, and there is not enough room for a coupled connection to fit between the two standard casing sizes.
- So a Semi-Flush or Flush connection is required to reduce the cross section and fit between the coupled casing.



OCTG and Well Integrity

What are the key parameters for OCTG with Premium Threads ?

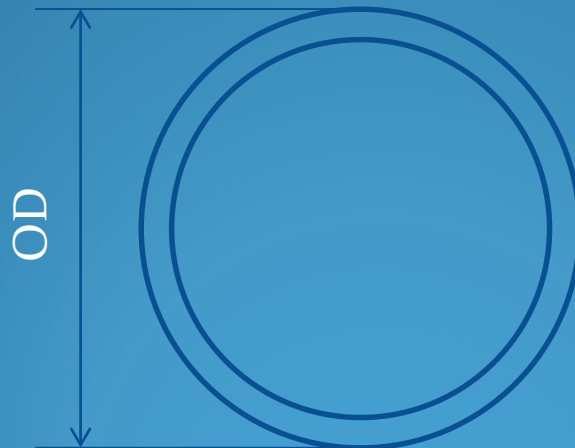
- Size.
- Poundage.
- Grade.
- PSL level.
- Thread family.
- Thread type
- Thread type suffix.
- Gender
- Length
- This refers to the OD of the casing or tubing.
- This refers to the wall thickness.
- This refers to the type of metal used.
- This refers to the acceptance criteria.
- This refers to the OEM or IP owner.
- This refers to the thread type / design
- This refers to any special variant of the thread type.
- This refers to a Pin (Male) or Box (Female) thread
- This is OAL (Over All Length) or EL (Effective Length)

e.g. 9 5/8", 53.5ppf, P110, PSL-3, VAM TOP HT, Pin x Box, 12' 6" OAL.

OCTG and Well Integrity

What does casing or tubing '**Size**' mean ?

- The Size of the casing or tubing is the OD of the pipe.
- Unlike many common water pipes and construction scheduled pipes, the OCTG casing OD remains constant, however only the ID changes



OD	
Select	
2 3/8	^
2 7/8	
3 1/2	
4	
4 1/2	
5	
5 1/2	
6 5/8	
7	
7 5/8	
7 3/4	
8 5/8	
9 3/8	
9 5/8	
9 3/4	
9 7/8	
10	
10 3/4	
11 3/4	
11 7/8	
13 3/8	
13 5/8	
14	
15	
16	
17 7/8	
17 15/16	
18	
18 5/8	v

OCTG and Well Integrity

What does poundage mean ?

- The poundage refers to the difference in wall thickness which affects the weight, and measured as Pounds per Foot.
- The casing OD remains constant, however the ID changes and as the ID gets smaller, the wall thickness increases and the weight gets higher.

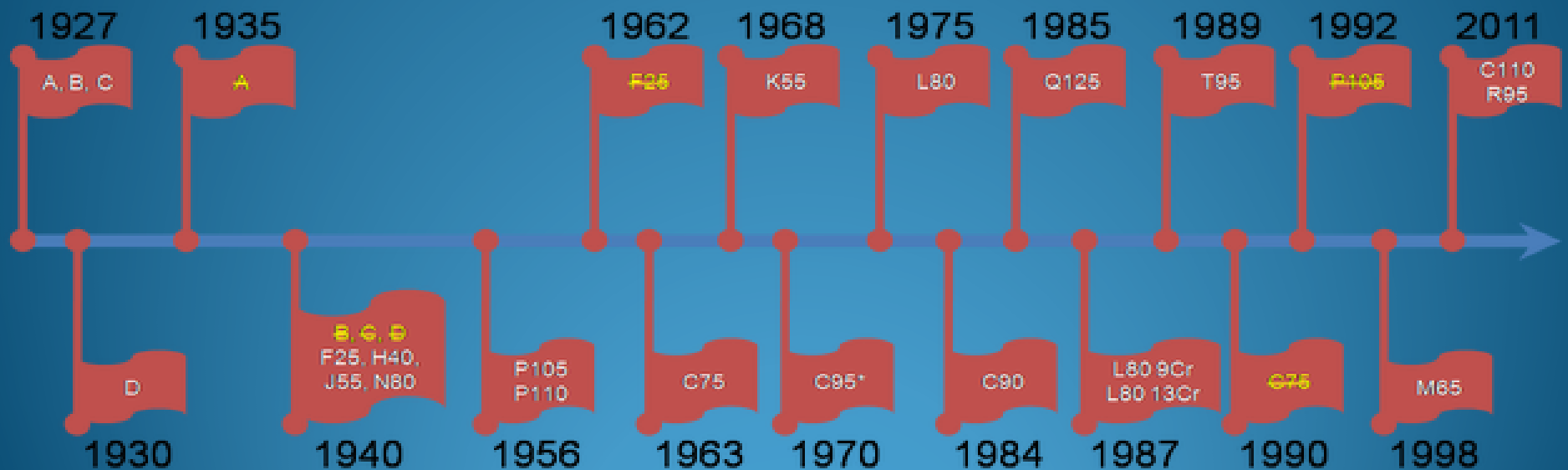
OD	Weight / Wall
7	Select
	20.00# /0.272
	23.00# /0.317
	26.00# /0.362
	29.00# /0.408
	32.00# /0.453
	35.00# /0.498
	38.00# /0.540
	41.00# /0.590
	42.70# /0.625
	44.00# /0.640
	46.40# /0.687
	49.50# /0.730



OD	Weight / Wall
9 5/8	Select
	36.00# /0.352
	40.00# /0.395
	43.50# /0.435
	47.00# /0.472
	53.50# /0.545
	58.40# /0.595
	59.40# /0.609
	61.10# /0.625
	64.90# /0.672
	70.30# /0.734
	71.80# /0.750
	75.60# /0.797
	80.80# /0.859

OCTG and Well Integrity

When were these Material Grades introduced ?



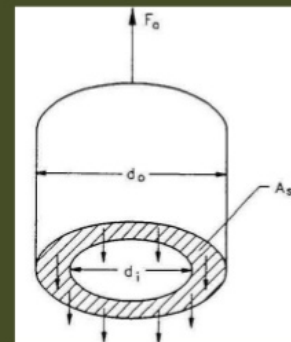
- * Not adopted by API
- 'E', 'G', 'S', and 'X' has been used for drill pipe
- 'X' also being used for line pipe

OCTG and Well Integrity

What does the number in the Material Grade mean ?

- P110 = 110 KSI MYS = 110 K (Kilo-pound [thousand pounds]) ~ *per* ~ S (square) I (inch) ~ M (minimum) Y (yield) S (strength) = 110,000 Lb/1"² minimum yield strength
- Comparing say L80 to P110 you can easily see that L80 has a minimum yield strength of 80 KSI and P110 has a minimum yield strength of 110 KSI.
- This is important in calculating the total amount of tubing or casing which can be suspended in the well.

- **Pipe body strength** is the minimal force required to cause permanent deformation of the pipe.



F_a = axial force to pull apart the pipe, lbf

A_s = cross-sectional area of the pipe, in.²

σ_y = minimum yield strength, psi

d_o = pipe outer diameter, in

d_i = pipe inner diameter, in

$$F_a = \sigma_y A_s$$

$$A_s = \frac{\pi}{4} (d_o^2 - d_i^2)$$

$$F_a = \frac{\pi}{4} \sigma_y (d_o^2 - d_i^2)$$

OCTG and Well Integrity

What do the colours mean ?

- The 'colour of the coupling' and 'the colour bands' on both the coupling and on the casing/tubing near to the coupling are used to help identify the material grade.



Grade	Grade type	Number and colour of bands for pipe, coupling stock and pup joints of length ≥ 6.0 ft	Colour(s) for coupling	
			Entire coupling	Band(s) ^a
1	2	3	4	5
H40		None or black band at the manufacturer's option	None	Same as for pipe
J55 tubing		One bright green	Bright green	None
J55 casing		One bright green	Bright green	One white
K55		Two bright green	Bright green	None
M65		One bright green, one blue	M65 pipe uses L80 Type 1 couplings	
N80	1	One red	Red	None
N80	Q	One red, one bright green	Red	Green
L80	1	One red, one brown	Red	One brown
L80	9Cr	One red, one brown, two yellow	Red	Two yellow
L80	13Cr	One red, one brown, one yellow	Red	One yellow
C90	1	One purple	Purple	None
C90	2	One purple, one yellow	Purple	One yellow
T95	1	One silver	Silver	None
T95	2	One silver, one yellow	Silver	One yellow
C95		One brown	Brown	None
P110		One white	White	None
Q125	1	One orange	Orange	None
Q125	2	One orange, one yellow	Orange	One yellow
Q125	3	One orange, one green	Orange	One green
Q125	4	One orange, one brown	Orange	One brown

^a Special-clearance couplings shall also have a black band.

OCTG and Well Integrity

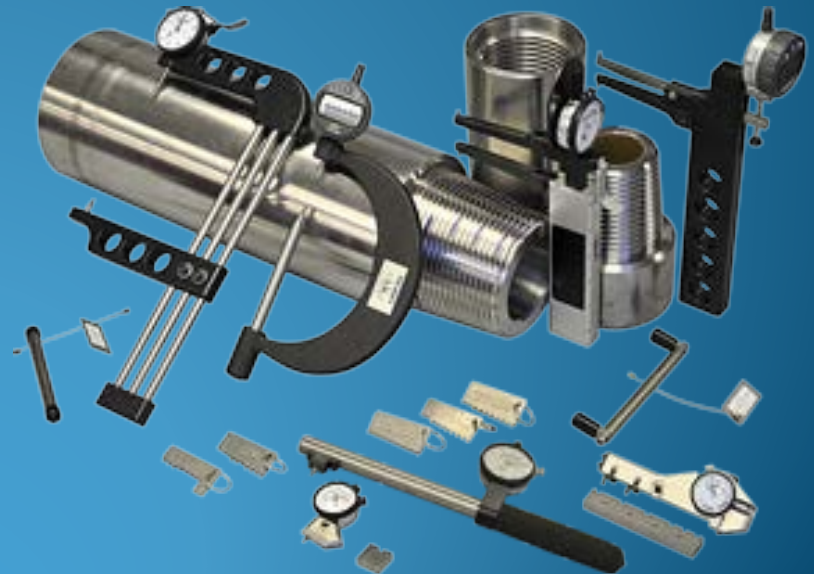
How to be sure the right **Material Grades** are used in Casing and Tubing ?

- There is an Industry wide global practice of full material traceability, from the mill which manufactures the metals to the actual well.
- Every single piece of Casing or Tubing or Accessory, **"MUST"** have full mill traceability, from the mill which made the raw material, known as the "MILL Cert", without exception.
- Any metals (regardless of value or urgency), which have lost traceability, regardless of the reason why, are scrapped!
- All manufacture facilities, logistic supply bases and oilfield operators have strict ISO compliant procedures to manage traceability and regular independent audits to verify compliance.

OCTG and Well Integrity

How precision are the Premium Threads?

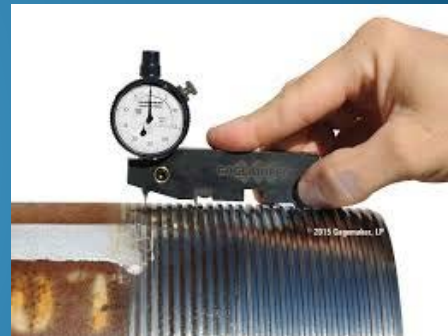
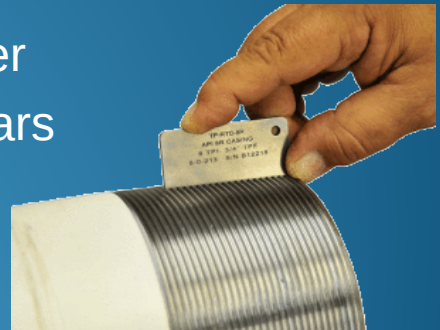
- Both OEM / Licensors and qualified Licensee OCTG machine shops have a lot of money invested in very unique and precision gauging equipment.
- Gauges must be calibrated regularly
- Every thread machined is inspected by:
 - The Machinist who cuts the thread
 - The Quality Inspector
- Reports are audited by Licensor
- Full document review internal
- Full document review by Group QA/QC
- Full document audit ISO auditor
- Full document audit customer auditor



OCTG and Well Integrity

How precision are the Premium Threads ?

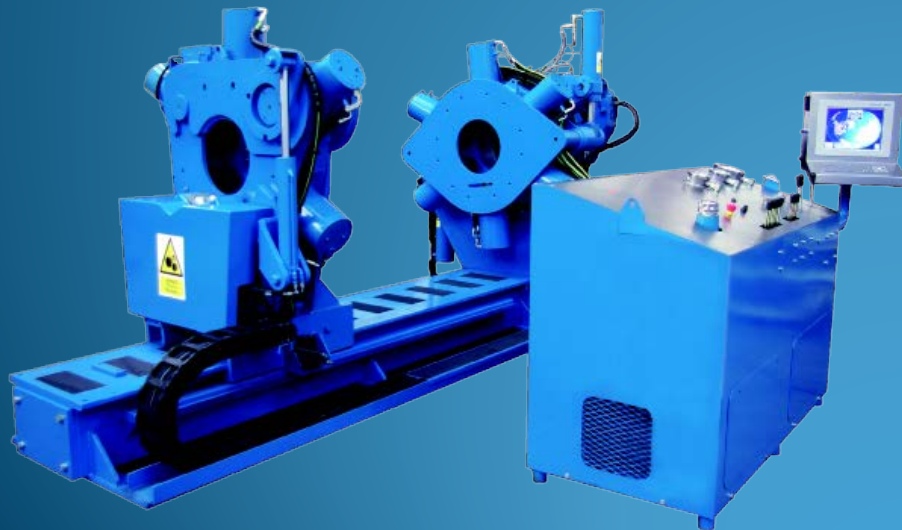
- Copy A4 paper is about 0.004" thick", or about 0.1 mm
- Typical Premium Thread tolerances are about 0.002" (0.0508mm) to about 0.0005" (0.0127mm)
- Or you could say about 1/2 to 1/8th the thickness of A4 paper
- Every dimension must be recorded and filed minimum 7 years
- Most OCTG MS will file dimensional reports indefinitely.



OCTG and Well Integrity

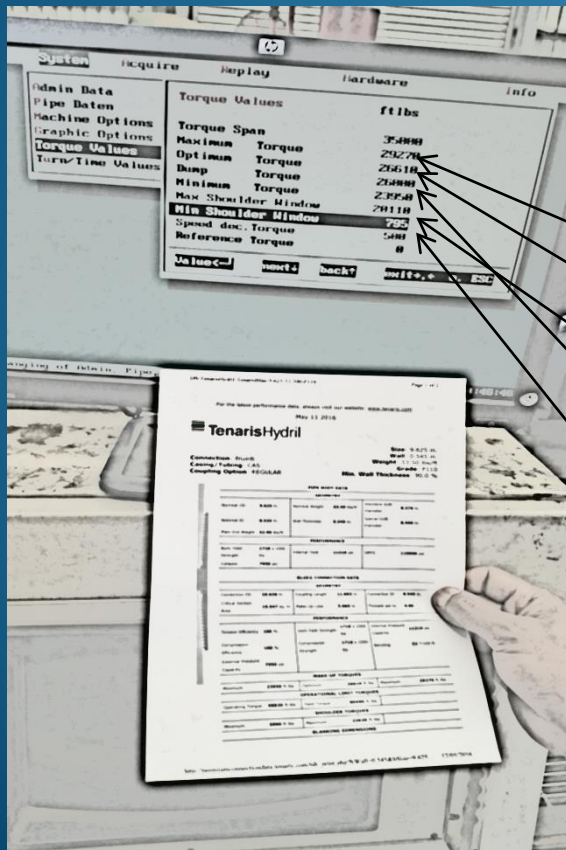
How are Premium Threads really made up ?

- In workshops a horizontal make-up machine is used
- On the Drill Rig a vertical make-up machine is used



OCTG and Well Integrity

How are the Premium Threads torque values entered into the machine ?

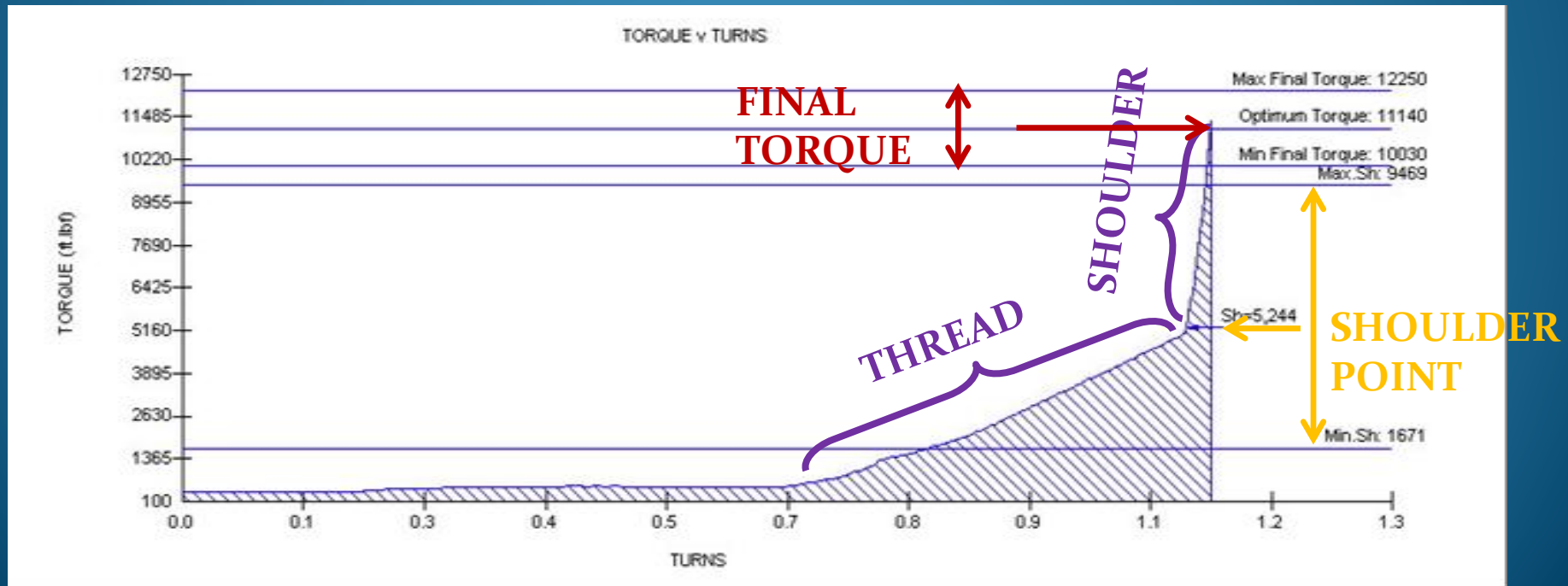


PIPE BODY DATA			
GEOMETRY			
Nominal OD	9.625 in.	Nominal Weight	53.50 lbs/ft
Nominal ID	8.535 in.	Wall Thickness	0.545 in.
Plain End Weight	52.90 lbs/ft		
PERFORMANCE			
Body Yield Strength	1710 x 1000 lbs	Internal Yield	11210 psi
Collapse	7950 psi	SMYS	110000 psi
BLUE® CONNECTION DATA			
GEOMETRY			
Connection OD	10.626 in.	Coupling Length	11.693 in.
Critical Section Area	15.547 sq. in.	Make-Up Loss	5.065 in.
		Connection ID	8.545 in.
		Threads per in.	4.00
PERFORMANCE			
Tension Efficiency	100 %	Joint Yield Strength	1710 x 1000 lbs
Compression Efficiency	100 %	Compression Strength	1710 x 1000 lbs
External Pressure Capacity	7950 psi	Internal Pressure Capacity	11210 psi
		Bending	52 °/100 ft
MAKE-UP TORQUES			
Minimum	23950 ft-lbs	Optimum	26610 ft-lbs
		Maximum	29270 ft-lbs
OPERATIONAL LIMIT TORQUES			
Operating Torque	58820 ft-lbs	Yield Torque	90490 ft-lbs
SHOULDER TORQUES			
Minimum	3990 ft-lbs	Maximum	22620 ft-lbs
BLANKING DIMENSIONS			

OCTG and Well Integrity

How are Premium Threads made up ?

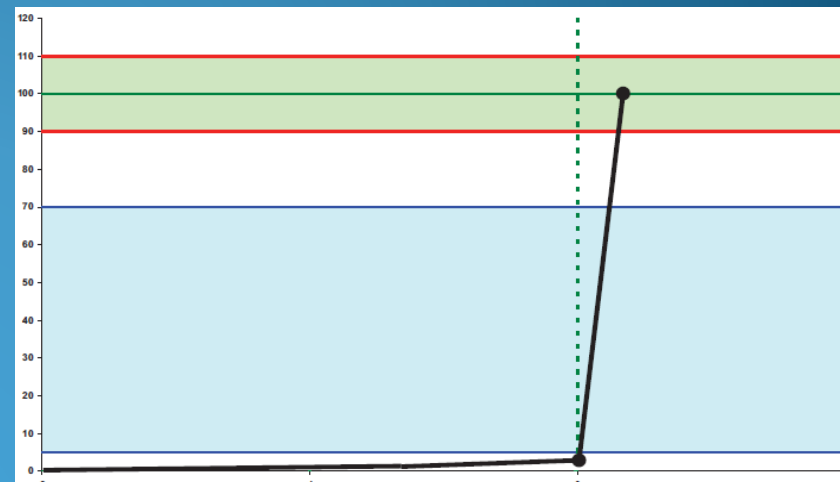
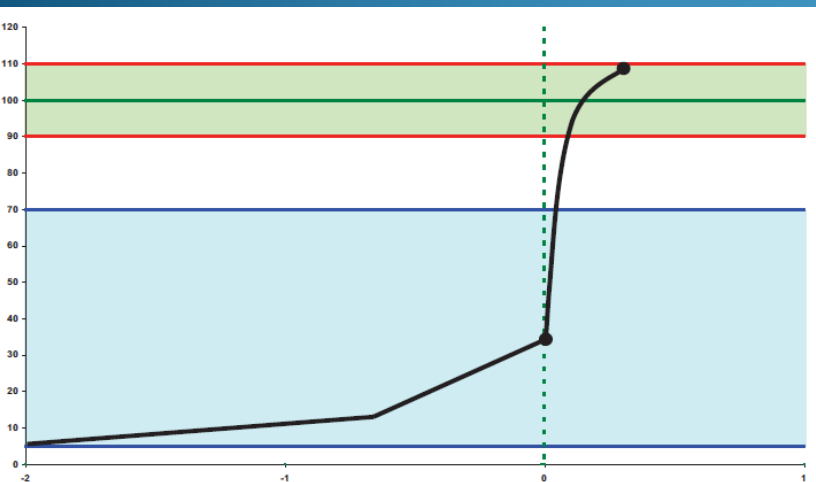
- Using calibrated 'Load Cells' and 'Tachometers', the make-up machines read Torque over Rotation and generate a 'Make-up Graph' by an industrial computer which can automate the make-up process



OCTG and Well Integrity

How to know if there is a problem with a Premium Thread made up ?

- Each OEM / Licensor, publishes a running manual with min acceptance criteria, to interpret a failed make-up.
 - In this first image, the material (seal shoulder) has begun to yield and as it continues to make-up, the resistance lowers as the shoulder fails
 - In the second image, the shoulder engaged early, without sufficient thread load, indicating a problem



OCTG and Well Integrity

How to know if there is an obstruction inside the casing / tubing ?

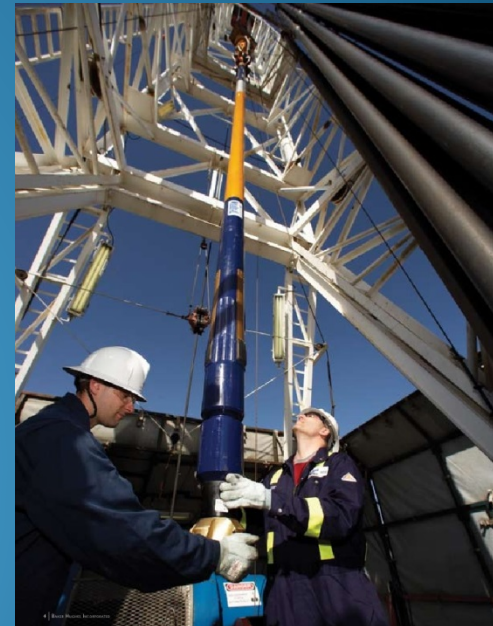
- Each API and Premium Thread has a 'Drift Size' based on it's OD and poundage.
- As drifts are classed as gauges, they must be regularly calibrated (measured) to ensure they are removed from service when worn below the minimum tolerance.
- Some Drifts are made from steel for use on Carbon Steel Casing.
- Some drifts are made from nylon for use on Nickel Chromium casing



OCTG and Well Integrity

How to know if the completion tools will work ?

It is common practice to pre-assemble the more complex completion tools in a workshop environment, where the individual sections can be made-up and both pressure tested and function tested, prior to going to the Rig



OCTG and Well Integrity

Summary

- Regulation of OCTG is covered in great details in API 5CT & API 5B and also in great detail by the respective OEM / Licensors.
- Special alloy metals are used for the different stages of the well, and where there is an expectation of any corrosive gases, resistant metals such as NACE MR0175 or 13 Cr-L80 are used.
- Patented designs of Premium Threads, are developed specifically to ensure a 'Gas Tight' connection every time.
- All connections are made up to a specific torque, using calibrated machines, with a detailed acceptance criteria.
- All OEM / Licensors and Licensee facilities receive a number of audits, by a number of independent audit teams, to verify all systems and processes are being adhered to.
- All quality and traceability documents are maintained for historical retrieval should a quality issue arise

OCTG and Well Integrity

Thank You

Questions ?