

***Part 192***  
***Subparts J & K***

**Testing & Upgrading**

# **MAOP, Testing, & Uprating**

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- **Are All Linked**
- **MAOP = Maximum Pressure Allowed By Regulations (192.619 et seq.)**
- **MAOP Determined By Operator for Each Pipeline or Segment**

# **MAOP For Pipelines Before 1970**

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- **System Design**
- **Test Pressure**
- **Operating History (MOP)**
- **Subject to Class Location Change**

# **MAOP For Pipelines After 1970**

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- **System Design**
- **Test Pressure**
- **Subject to Class Location Change**

# ***Part 192 – Subpart J***

## **Test Requirements**

# §192.501 ~ Scope

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- **Non- Retroactive**
- **Minimum Test Requirements**
- **Strength-Tests (Transmission)**
- **Leak-Tests (Distribution)**

## §192.503 ~ General

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- Test all Lines (New, Replacements, Relocations)
- Meet Requirements of Subpart J and §192.619 (Steel P/L  $\geq$  100 psig) to Establish/Substantiate MAOP

# §192.503 ~ General

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## □ Test Medium =

➤ Liquid (Water)

➤ Inert Gas

➤ Natural Gas

- Compatible with P/L Material

- Nonflammable (Except Natural Gas)

## §192.503 ~ General

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### Maximum Hoop Stress Allowed as Percentage of SMYS

<u>Class Location</u>	<u>Natural Gas</u>	<u>Air or Inert Gas</u>
1	80	80
2	30	75
3	30	50
4	30	40

## **§192.503 ~ General**

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- **Tie-In Joints Exempt from Pressure Testing**
- **NDT Tie-In Welds ( $\geq 20$  % SMYS)**
- **Leak Test Non-Welded Joints**

# **§192.505 ~ Strength Test Requirements**

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- **Steel Pipelines**
- **Operating at Hoop Stress  $\geq$  30% SMYS**

# §192.505 ~ Strength Test Requirements

- **Paragraph (a)** – Test per 192.619 (a)(2)(ii) to Establish/Substantiate MAOP

	Factors <sup>1</sup> , segment		
Class location	Installed before (Nov. 12, 1970)	Installed after (Nov. 11, 1970)	Covered under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

# §192.505 ~ Strength Test Requirements

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- **Paragraph (a) –**

Additional Requirements in Class 1 or 2

**----if----**

Residence(s) Within 300 feet of Pipeline

# §192.505 ~ Strength Test Requirements

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- **Paragraph (b) –**

Stations (Compressor/Regulator/Measuring)  
in Class 1 or 2 Locations

**---- must be ----**

Tested to Class 3 Location Requirements  
(150% MAOP of Station)

# **§192.505 ~ Strength Test Requirements**

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- **Paragraphs (c) & (e) –**

Maintain Test Pressure for at least 8 Hours

**---- except ----**

4 - Hour Minimum for Fab Units & Short Sections of Pipe Impractical to Test After Installation

# §192.505 ~ Strength Test Requirements

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- **Paragraph (d) –**

Individual Components Don't Require  
Post-Installation Test

---- if ----

Pre-Tested or QC'ed by Manufacturer

# §192.507 ~ Test Requirements

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- 100 psig  $\geq$  Pipeline MAOP  $<$  30% SMYS
- Except for Service Lines & Plastic Pipelines
- Strength and Leak Test

# §192.507 ~ Test Requirements (Steel Lines $\geq$ 100 psig)

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- Test per 192.619 (a)(2)(ii) to Establish/Substantiate MAOP

	Factors <sup>1</sup> , segment		
Class location	Installed before (Nov. 12, 1970)	Installed after (Nov. 11, 1970)	Covered under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

# **§192.507 ~ Test Requirements**

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- **Paragraph (a) –**

Test Procedure That Will Ensure Discovery of  
Potentially Hazardous Leaks

# §192.507 ~ Test Requirements

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- **Paragraph (b) –**

Additional Requirements if  $\geq 20\%$  SMYS & Air, Inert Gas, or Natural Gas as Test Medium:

1. Conduct Leak Test at Pressure Between 100 psig and 20% SMYS; or
2. Walk Line for Leaks While Holding Pressure at @ 20% SMYS

# **§192.507 ~ Test Requirements**

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- **Paragraph (c) –**

Maintain at or above Test Pressure for  
Minimum of One Hour

# §192.509 ~ Test Requirements

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- Pipeline MAOP < 100 psig
- Except for Service Lines & Plastic Pipelines
- Leak Test

# **§192.509 ~ Test Requirements**

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- **Paragraph (a) –**

Test Procedure That Will Ensure Discovery of  
Potentially Hazardous Leaks

# §192.509 ~ Test Requirements

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- **Paragraph (b) –**

1. Mains to Operate  $< 1$  psig, Test to 10 psig
2. Mains to Operate  $\geq 1$  psig, Test to 90 psig

**No Time Requirement Specified**

## **§192.511 ~ Test Requirements Service Lines (Other Than Plastic)**

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- **Paragraph (a) –**
  1. Leak Test Prior to Placing in Service
  2. If Feasible, Include Connection to Main
  3. If Not Feasible, Test Connection to Main In-Service at Operating Pressure

# **§192.511 ~ Test Requirements Service Lines (Other Than Plastic)**

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- **Paragraphs (b) & (c) –**

1. Service Lines  $> 1$  psig and  $\leq 40$  psig,  
Leak Test to Minimum of 50 psig
2. Service Lines  $> 40$  psig,  
Leak Test to Minimum of 90 psig
3. If Steel Service Line  $\geq 20\%$  SMYS,  
Test per §192.507

## **§192.513 ~ Test Requirements Plastic Pipelines**

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- **Paragraphs (a) and (b) –**
  1. **All** Plastic Lines (Transmission, Mains, Services)
  2. Use Test Procedure That Will Ensure Discovery of Potentially Hazardous Leaks

## **§192.513 ~ Test Requirements Plastic Pipelines**

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- **Paragraphs (c) and (d) –**

1. Test Pressure = Higher of 150% MAOP or 50 psig,  
Not to Exceed 3 X Design Pressure (§192.121)

2. During Test, Temp. of Plastic Cannot Exceed Higher  
of 100° F. or Temp. Used to Determine HDB

## **§192.515 ~ Environmental & Safety Requirements**

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1. Measures to Protect Employees & General Public.
2. Limit Access to Test Area While Above 50% SMYS.
3. Dispose of Test Medium in Environmentally-Safe Manner.

## **§192.517 ~ Records**

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- Required for Tests per §192.505 & §192.507
- Retain for Life of Pipeline or Segment
- Specific Information Required

## **§192.517 ~ Records**

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- Name of Operator/ Employee/Test Company
- Test Medium
- Test Pressure
- Test Duration
- Charts, Other Pressure Records
- Elevation Profiles
- Leaks, Failures & Disposition

## **§192.517 ~ Records**

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- Required for Tests per §192.509, 511, & 513
- Retain for Minimum of 5 Years
- Per Amendment 93

## **§192.725 ~ Test Requirements for Reinstating Service Lines**

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1. Retroactive – Applies to All Service Lines.
2. “Disconnected” Service Lines Must be Tested in Same Manner as New Service Lines.
3. Test from Point of Disconnection to Service Line Valve (Unless Service to Customer Maintained).

# ***Part 192 – Subpart K***

Updating

# What Is Uprating?

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**Increasing MAOP  
For Existing  
Pipelines While  
Maintaining  
Service**



# **Why Uprating?**

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**To Assist Operators With P/L  
Segments Caught By 5-year  
MOP Between 1965 - 1970**

# Uprating Code Sections

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- **192.553 ~ General Requirements.**
- **192.555 ~ P/L's  $\geq 30\%$  SMYS**
- **192.557 ~ P/L's  $< 30\%$  SMYS,  
Non-Steel Materials**

## **192.553 General Requirements**

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- **Controlled Pressure Increases**
- **Leak Checks After Increases**
- **Repair or Monitor Leaks Found**
- **Records for Life of Segment**
- **Written Upgrading Plan/Procedure**
- **Limitation on Increase in MAOP**

# **192.555**

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**Upgrading to a Pressure  
≥ 30% SMYS,  
Steel Pipelines**

## **192.555(b) ~ Before Upgrading**

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- **Review Design, O&M, Prior Testing**
- **Make Repairs, Replacements, Alterations As Required**

# **192.555(c) ~ P/L's Before 9/12/70**

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- **Establish MAOP per 192.619**
- **Test Pressure = Highest Pressure  
(previous test or operation)**

# 192.555(d) ~ (c) Doesn't Work?

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- Retest as New Line in Same Location
- Class 1, No Prior Test, Can't Test
  - New MAOP  $\leq 57.6\%$  SMYS (0.8 X 72%)
  - New MAOP ~ Design/Condition

# **192.555(e) ~ Pressure Increments**

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**To Increase Pressure per (c) or (d)(2),  
Fewer Of --**

- 1) 10% of Pressure Before Up-rating  
or**
- 2) 25% of Total Pressure Increase**

# 192.557

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Upgrading to a Pressure < 30%  
SMYS (Steel Pipelines);  
Other **Non-Steel** Materials

# **192.557(b) ~ Before Upgrading**

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- **Review Design, O&M**
- **Perform Leakage Survey (if > One Year Since Last Survey)**
- **Repair or Monitor Leaks**
- **Make Repairs, Replacements, Alterations**

# **192.557(b) ~ Before Upgrading**

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- **Reinforce/Anchor Exposed  
Offsets, Bends, Dead Ends**
- **Isolate From Lower Pressure  
Segments**
- **Install Service Regulators  
(Low-Pressure Distribution  
Systems)**

## **192.557(c) ~ Pressure Increments**

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**To Increase Pressure, Fewer Of --**

- 1) 10 psig increments**
- 2) 25% of Total Pressure Increase**
- 3) At Least 2 Increments for  
Low-Pressure Distribution**

## **192.557(d)**

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- **Additional Requirements for Cast Iron / Ductile Iron Segments**

# **Uprating ~ Major Concerns**

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- **What test pressure needed for new MAOP?**
- **Design not retroactive, Uprating is**
- **Less stringent requirements for old vs. new**
- **Some design/construction defects may  
not be apparent**
- **Uprating requirements confusing, difficult to  
read**