Specification for Pipeline Valves & Actuators

October 4, 2010

Presenter: Rick Faircloth
History of Standards Development

API
1\textsuperscript{st} Edition of API 6D was (API 5G1) was published in September 1936 and went through 5 revisions and officially published in June 1947 as API 6D -5\textsuperscript{th} edition we are now on the 23\textsuperscript{rd} Edition in 2008.

ISO
In 1990 Technical committee ISO TC67 - Standardization of the materials, equipment and offshore structures used in the drilling, production, transport by pipelines and processing of liquid and gaseous hydrocarbons within the petroleum, petrochemical and natural gas industries.

TC67 has approximately 30 member countries
Each country has (1) vote on technical ballots
Time to develop a new standard from Working draft to Publication is around 48 months
API Spec 6D Family Product Standards

API 6D – Pipeline Valves (Equivalent ISO 14313)

- Effective October 1st, 2008.

API 6DSS – Subsea Pipeline Valves (Equivalent ISO 14723)

- Effective June 1, 2010.

API 6DR – Repair & Remanufacture of Pipeline Valves

- New recommended practice published for repair & remanufacture of pipeline valves.
- (no licensing required – not in monogram program)
Highlights to API Spec. 6D – Pipeline Valves

• Revised clause on Reduced-opening valves as follows:
  Reduced opening valves with a circular opening through the obturator (ball/gate/plug) shall be supplied with a minimum bore as follows unless otherwise specified:
  - valves DN 300 (NPS 12) and below: one size below nominal size of valve with bore according to Table 1;
  - valves DN 350 (NPS 14) thru DN 600 (NPS 24): two sizes below nominal size of valve with bore according to Table 1;
  - valves above DN 600 (NPS 24): by agreement.

Example: a DN 400 (NPS 16) x DN 300 (NPS 12), PN 250 (Class 1500) reduced opening ball valve would have a minimum bore of 287 mm 11.300 “.

Reduced-opening valves with a non-circular opening through the obturator shall be supplied with a minimum opening by agreement.
Highlights to API Spec. 6D – Pipeline Valves

- New minimum bore sizes added to Class 900 for NPS 38, 40, 42 & 48, Class 1500 for NPS 18 thru 34, and Class 2500 for NPS 14 thru 20.

- New clauses on drain, vent and sealant lines, as well as drain, vent and sealant valves.

- Added new requirement for testing of drain, vent and sealant injection lines.

- New requirement for the manufacturer to issue material specifications on all pressure-containing and pressure-controlling parts.

- **Weld end valves of carbon steel** shall have maximum carbon content of 0.23%; Carbon equivalent shall not exceed 0.43%.
Highlights to API Spec. 6D – Pipeline Valves

• Added requirement for warning label to be added to the end protector of check valves to remove the internal blocking material used in transportation.

• Documentation retention is now increased from 5 years to 10 years.

• New expanded annex on NDE requirements.

• Added additional items to supplementary documentation requirements.

• Added new table in purchasing guideline to aid the user on specific information to be furnished by the manufacturer, purchaser, or both.
API Spec 6D

Scope

• This International Standard specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of *ball, check, gate and plug valves* for application in pipeline systems meeting the requirements of ISO 13623 for the petroleum and natural gas industries.

• This International Standard is not applicable to valves for pressure ratings exceeding PN 420 (Class 2500).

• *Class 4500 which is called out in ASME B16.34 is outside the scope of this standard.*
Changes to API 6D

New definitions:

**Packing gland**
component used to compress the stem packing-

**Piggability**
capability of a valve to permit the unrestricted passage of a pigs-

**Pressure-containing parts**
parts, whose failure to function as intended results in a release of contained fluid into the environment – *This is the same definition as API 6A*
API Spec 6D

New definitions: – continued…

**unless otherwise agreed**
modification of the requirements of this standard, unless the manufacture and purchaser agree on a deviation

**unless otherwise specified**
modification of the requirements of this standard, unless the purchaser specifies otherwise
API Spec 6D

Valve configurations

Added minimum bores dimensions for full opening valves

Class 900  38”-48”

Class 1500  18”-36”

Class 2500  14”-20”

Piston check valves and Axial flow (nozzle) check valves
API Spec 6D

Design

Design codes and calculations

• Pressure containing parts and materials including bolting as specified in ASME B16.34 and other international design code are also acceptable.

• Pressure containing parts design and calculations shall be in accordance with an agreed, internationally recognized design codes or standards, for example ASME Section VIII Division 1 or Division 2, ASME B16.34 or BS-5500
API Spec 6D

Design – continued…

Pressure ratings

- PN 20 (CLASS 150)
- PN 50 (CLASS 300)
- PN 64 (CLASS 400) - deleted from ASME B16.34
- PN 100 (CLASS 600)
- PN 150 (CLASS 900)
- PN 250 (CLASS 1500)
- PN 420 (CLASS 2500)
API Spec 6D

Design – continued…

Hand wheels and Wrenches

• The hand-wheel breakaway thrust/torque (rim pull) shall not exceed 360N (80lbf).

Position Indicators

• Visible position indicator showing the open and closed position of the obturator (closure member) of the ball, disc, gate or plug. This maybe a key slot or marking inline with the valve bore on the stem of ball valve

Weld Ends

• ASME B31.4 Figure 434.8.6(a) (1) and (2), or
• ASME B31.8 Figure I-4 and I-5
• ASME B16.25 Figure 1 – heavy wall bodies
API Spec 6D

Design – continued…

Flanged ends

• Offset of the flange centreline up to NPS 4 (0.079”) NPS 6 and larger (0.118”)

• Parallelism of the aligned flanges faces (0.03 in/ft)

• Total allowable misalignment of the bolt holes up to NPS 4 (0.079”) NPS 6 and larger (0.118”)

• see bolt hole misalignment next page…
Bolt Hole Misalignment Key

Figure 14 - Bolt hole misalignment

**Key:**

1. Flange
2. Hole in first flange
3. Hole in opposite flange to be aligned
A. Bolt hole alignment (see 7.7.1.4)
API Spec 6D

**Design** – *continued…*

**Alternate valve flange end connection**
- Hub end – Techlok, Taper-Loc, Greyloc, Swival Flange

**Lifting lugs**
- Valves 8” and larger, unless otherwise agreed
- Manufacturer shall verify the suitability of lifting points
- Safe working load equal to a least the weight of the valve
API Spec 6D

Design – continued…

Injection points

Injection points for sealant, lubrication or flushing shall be provided for seat and/or stem if specified by the purchaser and shall incorporate a check valve and a secondary means of isolation for each injection point.
API Spec 6D

Design – continued...

Drain, vent and sealant lines

Drain, vent and sealant line shall be provided if specified by the purchaser and shall be extended by means of rigid pipe-works, if necessary. The lines shall be fastened to the valve and/or extension and terminate close to the stem extension top works, by agreement.

The purchaser should specify the injection pressure or pipe to be used. If not specified by the purchaser, the manufacture shall advise the maximum injection pressure for the system. The size of the sealant lines shall be by agreement.
API Spec 6D

Design – continued…

Actuator/gearbox

• Interface between the actuator and valve bonnet shall be designed to prevent misalignment or improper assembly

• Operator, stem extensions and their interfaces shall be sealed to prevent ingress of external contaminants and moisture- (such as gasket, o-ring or liquid sealant).
API Spec 6D

Design – continued…

Drive trains

• Minimum design thrust or torque shall be at least 2-times the manufactures predicated breakaway max. thrust or torque at the maximum pressure differential (MPD).

The allowable stress for the drive train that address shear, torsion and bearing stress shall not exceed ASME Section VIII, Division 2, Part AD-132 :2004
API Spec 6D

Materials

• Manufacturer shall develop documented material specification for pressure-containing & pressure-controlling parts agreed design standard such as ASME B16.34.

• Service compatibility - Non-metallic parts for valves intended for hydrocarbon gas service for valves above class 600 shall be resistant to (ED) explosive decompression.

• Chemical/ Carbon equivalent restrictions - **carbon steel weld end valves**
  - 0.23% max. Carbon content
  - 0.035% max. Phosphorus & 0.035% max. Sulfur,
  - 0.43% max. carbon equivalent (CE)

• Austenitic Stainless steel weld end valves
  - 0.03% max. Carbon
  - 0.08% max. Carbon if the material is stabilized
API Spec 6D

Material – continued...

- Fracture toughness (low temperature) on base material & weld metal is based on tensile for all carbon/ alloy material design temperature below -29°C (-20°F).

- Bolting material with a hardness exceeding HRC 34 (HBW 321) shall not be used for valve applications where hydrogen embrittlement can occur, unless otherwise agreed. Standard would be to use ASTM A193-B7/ASTM A194-2H if valve is not buried or insulated, otherwise ASTM A193-B7M/ASTM A194-2HM is required.

- Sour service – Materials for pressure containing and pressure controlling parts and bolting shall meet the requirements of ISO-15156, if sour service is specified by the purchaser. There are limits on pH, temperature, % partial pressures H2s and % chlorides in many materials.

API Spec 6D

Material – continued…

• Repair of defects shall be preformed in accordance with documented procedures and shall specify requirements for defect removal, welding, heat treatment, NDE and reporting as applicable. Fabrication welds such as (pipe pups to valve) have limits on extent of repair – 20% on partial penetration and 30% on full penetration.

• Welding repair of forgings and plates to correct manufacturing defects shall be by agreement. This is not normally allowed unless the weld repaired area will be removed during manufacturing.

• Weld repair of castings shall be in accordance with the applicable material standards (such as ASTM, ASME, etc.).
API Spec 6D

Quality Control

• Calibration of pressure gauges shall be at +/- 2% of full scale range of the pressure gauge and operating pressure of shall be between 20% and 80% of full scale range.

• Purchaser may select as optional from Annex A any of the (22) different NDE inspections method/acceptance criteria for (MT/PT/RT/UT) on cast, forged, plate or weldment.

• NDE personnel shall be qualified in accordance with ASNT-TC-1A or ISO 9712. *The ASNT qualification is used as most US manufactures NDE personnel are qualified to ASNT-TC-1A*

• Personnel performing visual examinations shall have passed an annual eye examination in accordance with ASNT-TC-1A or ISO 9712.
API Spec 6D

Testing

• Standard hydrostatic shell test duration of (2/5/15/30 minutes) and hydrostatic seat test duration of (2/5 minutes) are based on valve bore size. Customer may request long test duration by agreement.

• If the valve has been previously tested in accordance with API 6D, subsequent repeat testing may be performed without removal of the external coating.

• Test fluid of light-weigh oil by agreement, may be used during shell and seat test provided the viscosity doesn’t exceed that of water. This will allow some manufactures to lubricate the valve internals to prevent corrosion on bare surfaces.
API Spec 6D

Testing – continued…

• Double –block-and-bleed and double-isolation-and-bleed testing is now an optional test in Annex B and not mandatory as was in the 22nd Edition of API Spec 6D.

• Testing of drain, vent and sealant lines shall be subjected to a hydrostatic test with the valve. If testing with the valve is not practical, these lines may be tested separately, provided the final assembly connection is subjected to full hydrostatic test or by agreement, pneumatic pressure test of 80 PSI.
API Spec 6D

Marking

Body/cover/closure stamping shall be performed using low-stress die-stamp, rounded "V" or Dot Face Type. Each valve shall be provided with an austenitic (300 series) stainless steel nameplate securely affixed and so located that it is easily accessible. The markings on the nameplate shall be visually legible.
API Spec 6D

Preparation

Plug, ball and reverse-acting through conduit gate valves shall be shipped in the fully open position, unless fitted with a fail-to-close actuator.

Check valves 8NPS and larger shall be shipped with the clapper secured or supported during transport. A warning label shall be attached to the valve end protective cover with instructions to remove the internal material prior to installation.
API Spec 6D

Documentation

- Design documentation, WPS / PQR, Welder and NDE personnel qualification records, material test reports on the body, bonnet/cover, end closure, pressure test report and NACE certificates shall be maintained by manufacturer for 10 years from date of manufacturer.

- Purchaser shall specify any additional supplementary documentation required and can be found in Annex C.
API Spec 6D

Annex A – Requirements for non-destructive examination

This annex specifies the requirements for (22) types of non-destructive examination (PT-MT-RT-UT) including acceptance criteria that shall be performed by the manufacturer if specified by the purchaser… only mandatory when specified in the purchase order

A.2 Radiographic testing (RT) of castings on 100 % of critical areas
Examination shall be carried out in accordance with ASME B16.34, Appendix-I.
Acceptance shall be in accordance with ASME B16.34, Appendix-I.

A.11 Magnetic-particle testing (MT) of castings on 100 % of surface area
Examination shall be carried out in accordance with ASME Section V, Article 7.
Acceptance shall be in accordance with ASME Section VIII, Div. 1, Appendix 6, except that relevant indications (rounded and linear) of less than 5 mm are acceptable.
API Spec 6D

Annex B - Supplementary testing ... only mandatory when specified in the purchase order

B.3 Low pressure gas seat testing –
   Type I - Seat tests are available using air or nitrogen gas test medium, between 7.3psi-14.5 psi.

   Type II - Seat tests are available using air or nitrogen gas test medium at 80 psi.

B.4 High pressure gas testing –
   Both shell and seat tests are available using inert gas test medium at 1.1 times the MAOP.

   Note: this test shall be preformed after the hydrostatic shell test.
**API Spec 6D**

**Annex C - Supplementary Documentation**

shall be furnished by the manufacturer to the purchaser...

*only mandatory when specified in the purchase order*

- WPS / PQR / Welder Qualification
- NDE records
- NACE certification
- Hardness test report on pressure-containing parts
- Heat-treatment certification records (e.g. charts)
- Design calculations for pressure-containing parts and/or drive train, for review by the purchaser or design verification by certification body / agency
API Spec 6D

Annex C – continued…

• NDE personnel qualification records

• NDE procedures

• Calibration records (purchaser to identify requirements for equipment when ordering)

• Material certification to ISO 10474 / EN-10204 (purchaser to specify the type of certification, and for which parts, when ordering)

• Pressure test reports

• Type approval by certification body/ agency.

• IOM - general arrangement drawings, cross-sectional parts list drawing, flow coefficient, ISO certificate,
API Spec 6D

Annex D - Purchasing Guidelines

• Pigging – The purchaser should examine the valve design for piggability when ordering the valves for use in pipelines requiring pigging. Note that some valve designs can not be pigged.

• Fire type-testing – ISO 10497 – API 6FA, API 6FC, API 6FD, API 607

• Valve data sheet-sample form is provided for purchaser to complete when ordering valves

• Optional additional testing as required by purchaser
API Spec 6D

Annex D – Table D.2 - summary table of clause requirements between manufacturer/purchaser

Technical clauses within the text for easy reference:

\[\text{M} = \text{information to be supplied by manufacture}\]

\[\text{P} = \text{information to be supplied by purchaser}\]

\[\text{A} = \text{information to be established by agreement}\]
Table D.2 – Summary of information needed to be provided by manufacturer and/or purchaser

<table>
<thead>
<tr>
<th>Clause/sub - clause</th>
<th>Information</th>
<th>Provider(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.2</td>
<td>Reduced bore sizes other than those shown in tables</td>
<td>P</td>
</tr>
<tr>
<td>6.2.2</td>
<td>Obturator size for non circular openings</td>
<td>A</td>
</tr>
<tr>
<td>6.2.2</td>
<td>Obturator openings in reduced bore valves above DN 600 (NPS 24)</td>
<td>A</td>
</tr>
<tr>
<td>7.1</td>
<td>Pressure vessel design</td>
<td>A</td>
</tr>
<tr>
<td>7.2</td>
<td>Intermediate design pressure and temperatures</td>
<td>P</td>
</tr>
<tr>
<td>7.2</td>
<td>Minimum design temperature</td>
<td>P</td>
</tr>
<tr>
<td>7.4</td>
<td>Face-to-face or end-to-end dimension</td>
<td>A</td>
</tr>
<tr>
<td>7.4</td>
<td>Tolerances other than those listed</td>
<td>A</td>
</tr>
<tr>
<td>7.5</td>
<td>Advise MPD</td>
<td>P</td>
</tr>
<tr>
<td>7.5</td>
<td>Valve operation data, torque/thrust, (C_v, K_v) or number-of-turns data</td>
<td>M-P</td>
</tr>
<tr>
<td>7.6</td>
<td>Requirements for piggability</td>
<td>P</td>
</tr>
<tr>
<td>7.7.1</td>
<td>Alternate standard for flanges</td>
<td>A</td>
</tr>
<tr>
<td>7.7.2</td>
<td>Weld bevels</td>
<td>A</td>
</tr>
<tr>
<td>7.7.2</td>
<td>Mating pipe data</td>
<td>P</td>
</tr>
<tr>
<td>7.7.3</td>
<td>Other end connections</td>
<td>P</td>
</tr>
<tr>
<td>7.8</td>
<td>Determination of whether fluid can become trapped in valve cavities</td>
<td>M</td>
</tr>
<tr>
<td>7.8</td>
<td>Pressure relief, if not required for liquid or condensing service</td>
<td>A</td>
</tr>
</tbody>
</table>

\(^a\) M indicates information to be supplied by manufacturer; M-P indicates information to be supplied by manufacturer when required by purchaser; P indicates information to be supplied by purchaser; A indicates information to be established by agreement.
### Table D.2 (continued)

<table>
<thead>
<tr>
<th>Clause/sub-clause</th>
<th>Information</th>
<th>Provider*</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8</td>
<td>Pressure relief, if required for gas service</td>
<td>A</td>
</tr>
<tr>
<td>7.8</td>
<td>Requirements for in-service testing</td>
<td>P</td>
</tr>
<tr>
<td>7.9</td>
<td>Alternative vent/drain connections</td>
<td>P</td>
</tr>
<tr>
<td>7.9</td>
<td>Thread profiles</td>
<td>A</td>
</tr>
<tr>
<td>7.9</td>
<td>Connection sizes</td>
<td>A</td>
</tr>
<tr>
<td>7.10</td>
<td>Sealant injection</td>
<td>P</td>
</tr>
<tr>
<td>7.11</td>
<td>Requirement for extended drain, vent or injection points</td>
<td>P</td>
</tr>
<tr>
<td>7.11</td>
<td>Securing of drain, vent and sealant lines</td>
<td>A</td>
</tr>
<tr>
<td>7.11</td>
<td>Design pressure and size etc., of extended drain, vent and sealant lines</td>
<td>P</td>
</tr>
<tr>
<td>7.11</td>
<td>Maximum injection pressure for extended injection lines, in absence of purchaser specification</td>
<td>M</td>
</tr>
<tr>
<td>7.11</td>
<td>Size of sealant lines</td>
<td>A</td>
</tr>
<tr>
<td>7.12</td>
<td>Requirement for valves in vent, drain and injection lines</td>
<td>P</td>
</tr>
<tr>
<td>7.13</td>
<td>Wrench head design</td>
<td>P</td>
</tr>
<tr>
<td>7.13</td>
<td>Hand wheel diameter(s)</td>
<td>A</td>
</tr>
<tr>
<td>7.13</td>
<td>Number of turns</td>
<td>M</td>
</tr>
<tr>
<td>7.14</td>
<td>Locking devices</td>
<td>P</td>
</tr>
<tr>
<td>7.18.1</td>
<td>Actuator output, if greater than drive train strength</td>
<td>A</td>
</tr>
</tbody>
</table>

* M indicates information to be supplied by manufacturer;
  M-P indicates information to be supplied by manufacturer when required by purchaser;
  P indicates information to be supplied by purchaser;
  A indicates information to be established by agreement.
### Table D.2 (continued)

<table>
<thead>
<tr>
<th>Clause/sub-clause</th>
<th>Information</th>
<th>Providera</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.19</td>
<td>Lifting points</td>
<td>A</td>
</tr>
<tr>
<td>7.19</td>
<td>Lifting procedure</td>
<td>M</td>
</tr>
<tr>
<td>7.20.3</td>
<td>Demonstration of valve function under pressure and pipe loads and moments</td>
<td>M</td>
</tr>
<tr>
<td>7.22</td>
<td>Requirements for fire-type-testing certification</td>
<td>P</td>
</tr>
<tr>
<td>7.22</td>
<td>Fire-type-testing certificate if not in accordance with Clause D.5</td>
<td>A</td>
</tr>
<tr>
<td>7.23</td>
<td>Anti-static device, if not provided on soft seal valve</td>
<td>A</td>
</tr>
<tr>
<td>7.23</td>
<td>Anti-static device testing per clause B.5</td>
<td>P</td>
</tr>
<tr>
<td>8.1</td>
<td>Material specification</td>
<td>A</td>
</tr>
<tr>
<td>8.2</td>
<td>Commissioning fluids</td>
<td>P</td>
</tr>
<tr>
<td>8.4</td>
<td>Composition limits</td>
<td>A</td>
</tr>
<tr>
<td>8.4</td>
<td>Chemical composition of welding end</td>
<td>A</td>
</tr>
<tr>
<td>8.4</td>
<td>Chemical composition of other materials</td>
<td>A</td>
</tr>
<tr>
<td>8.5</td>
<td>Charpy tests for other materials</td>
<td>A</td>
</tr>
<tr>
<td>8.6</td>
<td>Bolting for hydrogen embrittlement</td>
<td>A</td>
</tr>
<tr>
<td>8.7</td>
<td>Sour-service requirements</td>
<td>P</td>
</tr>
<tr>
<td>8.7.2</td>
<td>HIC acceptance criteria</td>
<td>A</td>
</tr>
<tr>
<td>9.1</td>
<td>Additional welding requirements to meet pipeline requirements</td>
<td>P</td>
</tr>
</tbody>
</table>

*a*  
M indicates information to be supplied by manufacturer;  
M-P indicates information to be supplied by manufacturer when required by purchaser;  
P indicates information to be supplied by purchaser;  
A indicates information to be established by agreement
<table>
<thead>
<tr>
<th>Clause/sub-clause</th>
<th>Information</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.3</td>
<td>Use of other hardness test methods</td>
<td>A</td>
</tr>
<tr>
<td>9.4</td>
<td>Through-wall weld repairs</td>
<td>A</td>
</tr>
<tr>
<td>9.4</td>
<td>Weld repairs to correct defects in plates and forgings</td>
<td>A</td>
</tr>
<tr>
<td>9.4</td>
<td>Specification for defect removal and repair</td>
<td>M</td>
</tr>
<tr>
<td>10.1</td>
<td>NDE requirements</td>
<td>P</td>
</tr>
<tr>
<td>10.4</td>
<td>NDE before final heat treatment</td>
<td>A</td>
</tr>
<tr>
<td>10.4</td>
<td>NDE requirements for weld repair</td>
<td>P</td>
</tr>
<tr>
<td>10.5</td>
<td>NDE of weld ends</td>
<td>P</td>
</tr>
<tr>
<td>11.1</td>
<td>Supplementary tests in Annex B</td>
<td>P</td>
</tr>
<tr>
<td>11.1</td>
<td>Use of light oil as an alternative to water for test media</td>
<td>A</td>
</tr>
<tr>
<td>11.1</td>
<td>Test sequence</td>
<td>A</td>
</tr>
<tr>
<td>11.1</td>
<td>Use of antifreeze in test water</td>
<td>A</td>
</tr>
<tr>
<td>11.3</td>
<td>Method of closing ends</td>
<td>A</td>
</tr>
<tr>
<td>11.4.1</td>
<td>Lubricant removed for testing</td>
<td>A</td>
</tr>
<tr>
<td>11.4.3</td>
<td>Other leakage rates</td>
<td>A</td>
</tr>
<tr>
<td>11.4.4.3</td>
<td>Valve seat functionality</td>
<td>P</td>
</tr>
<tr>
<td>11.4.5</td>
<td>Cavity relief test</td>
<td>P-M</td>
</tr>
<tr>
<td>11.4.7</td>
<td>Alternative test: high-pressure gas in lieu of water</td>
<td>A</td>
</tr>
<tr>
<td>11.5</td>
<td>Pneumatic testing of drain, vent and sealant lines</td>
<td>A</td>
</tr>
</tbody>
</table>

* M indicates information to be supplied by manufacturer;  
  M-P indicates information to be supplied by manufacturer when required by purchaser;  
  P indicates information to be supplied by purchaser;  
  A indicates information to be established by agreement.
**Table D.2 (continued)**

<table>
<thead>
<tr>
<th>Clause/sub-clause</th>
<th>Information</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>Test pressure of sealant injection lines</td>
<td>A</td>
</tr>
<tr>
<td>12</td>
<td>Coating requirements</td>
<td>A</td>
</tr>
<tr>
<td>13</td>
<td>Omission of marking requirements on valves NPS 2 and smaller</td>
<td>A</td>
</tr>
<tr>
<td>13</td>
<td>Marking requirements</td>
<td>P</td>
</tr>
<tr>
<td>15</td>
<td>Requirement for longer data-retention period</td>
<td>P</td>
</tr>
<tr>
<td>15</td>
<td>Requirement for supplementary information</td>
<td>P</td>
</tr>
<tr>
<td>Annex A</td>
<td>NDE requirements</td>
<td>P</td>
</tr>
<tr>
<td>Annex B</td>
<td>Supplementary test requirements</td>
<td>P</td>
</tr>
<tr>
<td>Annex C</td>
<td>Supplementary documentation requirements</td>
<td>P</td>
</tr>
<tr>
<td>Annex D</td>
<td>Purchasing guidelines</td>
<td>P</td>
</tr>
</tbody>
</table>

* M indicates information to be supplied by manufacturer;
  M-P indicates information to be supplied by manufacturer when required by purchaser;
  P indicates information to be supplied by purchaser;
  A indicates information to be established by agreement
Annex 1 Requirements for Hydrostatic Testing and Records
Retention to meet DOT requirements- Not yet part of API 6D

- Extended hydrostatic shell at 1.5 times the MAOP test 4-hours for all sizes
- Test records:
  
  To include the Vendor’s name, the name of the Vendor’s employee responsible for making the test, and the name of any testing company other than the valve manufacturer if one is used. Test fluid medium use shall be listed on the test records. The beginning, ending, and minimum test pressure and temperature readings shall be noted on the record, unless otherwise agreed. The test duration.

- A digital record, or chart recording, used for pressure readings.
- Any significant variations in pressure or temperature for the particular test.
- Any leaks and failures and their disposition.
- Certificates of calibration for all instrumentation.
ISO 12490  Pipeline valve Actuators

• Petroleum and Natural Gas Industries-Pipeline Transportation Systems-Mechanical integrity and sizing of actuators and mounting kits for pipeline valves
ISO 12490 : SCOPE

• This International Standard defines the requirements for mechanical integrity and sizing for actuators used on valves manufactured under ISO 14313 and API Specification 6D.

• This International Standard is applicable to all types of electric, pneumatic and hydraulic actuators, inclusive of mounting kit, installed on pipeline valves.

• This International Standard is not applicable to actuators installed on control valves, valves being used for regulation, valves in sub-sea service, handheld powered devices, stand alone manual operators, instrument tubing and associated fittings and actuator control equipment.
ISO 12490 : Design

• Provides rules for designing electric, pneumatic and hydraulic actuators, with specific requirements for pressure containing parts, bolting, tie-rods, and spring design

• Also provides rules for design of the mounting kit
ISO 12490 : Sizing

• Requires six valve torque/thrust data points: break open, run and re-seat in open and closed directions

• Provides rules for sizing based on the valve torque/thrust, supply energy data, spring sizing, safety factor and other data
ISO 12490: Materials - Welding

- Requirements for content of material specifications are listed
- Composition limits for carbon and stainless steel and ductile iron
- Rules for welding pressure containing and structural parts
ISO 12490 : Work Group

WG technical experts includes:

• Actuator manufacturers

• Valve manufacturers

• End users

• Actuation centers

• Countries: Brazil, France, Germany, Italy, Netherlands, Italy, United Kingdom and United States
ISO 12490 : Meetings

• Schedule
  • July 2008, London, UK
  • September 2008, Groningen, NL
  • November 2008, Hengelo, NL
  • January 2009, Houston, TX
  • March 2009, Paris, FR
  • September 2009, Banbury, UK
  • October 2009, Berlin, DE
  • September 2010, London, UK
ISO 12490 : Document Status

• Document is currently in (DIS) Draft International Standard stage, scheduled to be edited in early October when it will move to (FDIS) Final Draft International Standard stage.

• After 2 month voting by 30 countries and final editing by ISO in Geneva the anticipate FDIS vote to close Q1 2011, with publication in Q2 2011.
Any questions -

Contact info:
Rick.faircloth@c-a-m.com
Ph: 281-261-3672