NFPA-99, 2012/2015 Compliance with Manufactured Assemblies Employing Flexible Connections

5.1.14.2.3.1

Presented by Kent Buzard, David Sterrett, Compass Cryogenics 9-23-19
5.1.14.2.3.1 Manufactured assemblies employing flexible connections between user terminal and the piping system.

(A) Non-stationary booms and articulating assemblies other than headwalls utilizing flexible connectors, shall be tested for leaks, per manufacturers recommendations every 18 months or at a duration as determined by a risk assessment.

(B) The system pressure to non stationary booms and articulating arms shall be maintained at operating pressure until each joint has been examined by effective means of leak detection that is safe for use with Oxygen.

(C) Safe working condition of the flexible assemblies shall be confirmed.

(D) DISS connections internal to the boom shall be checked for leakage.

(E) Leaks if any shall be repaired (if permitted) or the components replaced (if required) and equipment retested prior to placing equipment back into service.

(F) Additional testing of non stationary booms or articulating arms shall be performed at intervals defined by documented performance data.
What led to this requirement

- Flexible Line fatigue with age
- High Pressure lines bursting during procedures/ non sterile
- Oxygen lines bursting during procedures
- Operating room fires
- OR Ceiling fires
- Code became effective July 2016 for 18 month trial period, code required as of 1/1/2018
What led to this requirement

- Flexible Line fatigue with age
What led to this requirement

- High Pressure line burst during procedure
What led to this requirement

- Oxygen lines bursting during procedures/
What led to this requirement

- Operating room fires

The Fire Triangle in the OR – The 3 elements that must come together to have a fire occur
What led to this requirement

- OR Ceiling fires
What led to this requirement

- The Code became effective July 2016 for 18 month trial period, code required as of 1/1/2018
- This is part of the Medical Gas Inspection requirement to be inspected to NFPA-99, 2012, 2015 or 2018 requirements
- This shall be part of your Medical Gas Management Plan. If you own the plan, you own this responsibility
An Inspection that fulfills the Code:

- Leak detection of the Boom or assembly with flexible lines at pressure
- Confirm safe working condition of the flexible assemblies, (open them up)
- DISS connections internal to the boom checked for leaks, (Internal leak check)
- If Leaks are found, they shall be repaired with retesting of system documented before putting back into service
INSPECTION PROCEDURE

- General Condition
  - Note Make, Model, Serial Number, and MFG date
  - Note general condition. Endcaps/access covers in place and properly secured.
  - Articulate boom within limits of its applicable range allowing effective transfer with no hitching or stopping.
  - Determine brake holds boom in position without creep.
  - Determine operational gas to brake is not Medical Grade Air.
  - Note any deficiencies.

- Flow and Pressure Testing
  - Test all MedGas outlets for adequate flow and pressure (PSIG, SCFM, Pressure Drop between adjacent outlets)
  - Re-test the outlets in extended and contracted positions to ensure flow and pressure meet requirements
  - Test the vacuum inlets for required vacuum (inHg, SCFM, Pressure Drop between adjacent inlets)
  - Re-test the vacuum inlets in extended and contracted positions to insure vacuum is maintained
  - Note any deficiencies

- Static Pressure Test
  - With functional Zone Valves open to the operating room note and record pressure and vacuum readings
  - Close all functional Zone valves for 10 minute standing pressure test
  - Check for leaks using ultra-sonic leak detector.
  - Record pressures and vacuum readings at the end of 10 minute pressure test and note any deficiencies
  - Return Zone Valves to original open position.

- Visual Inspection
  - Find and open access all ports on boom arms working in a team of two for after hours on Ladder safety requirements
  - Visually inspect the condition of the internal hoses and note and photograph any kinks, twists, or abrasions make adjustments and simple repairs as you proceed. Use the Boroscope for any tight visibility challenges - areas
  - Use Ultrasonic detection and or O2 grade snoop on lines and DISS connections to identify developing leaks. Do a thorough check of ceiling DISS connections and outlet DISS end connections.
  - Record and save photo(s) representative of general condition
  - Vacuum accumulated dust and lint to remove with a HEPA Vacuum
  - Close and secure access ports. Double check
  - Return boom to original resting position. Check tool inventory.
  - Note any deficiencies, double check zone valves before leaving.
Not sufficient Inspections

- Isolate Zone valve for each OR and record any notable pressure drop and notate your compliant.
- Go over exterior of boom with ultrasonic leak detection and notate your compliant.
- Do Nothing and hope no one checks but still notate your inspected to NFPA 99, 2012, 2015 or 2018 versions.
An Inspection that fulfills the Code:

- Full Leak detection of the Boom or assembly with flexible lines at pressure
An Inspection that fulfills the Code:

- Confirm safe working condition of the flexible assemblies
An Inspection that fulfills the Code:

- **DISS** connections internal to the boom to be checked for leaks, (Internal leak check)
An Inspection that fulfills the Code:

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What is found: Why we clean!!
An Inspection that fulfills the Code:

- If Leaks are found, they shall be repaired with retesting of system documented before putting back into service.
An Inspection that fulfills the Code:

HEPA Vacuum the lint while units are open
Before HEPA Vacuum, after HEPA Vacuum
Why you need to Inspect:

- The code was implemented for life safety
- When you inspect properly it takes an extra 5 minutes to remove dust, dirt and lint improving the sterile environment.
- Critical Care / OR and procedure room booms should be done annually or follow the suggested 18 months best practice.
- Acute care booms upon a first inspection risk assessment may be considered for a different cycle.
Thanks for your time today!

Kent Buzard, Compass Cryogenics Partner

Dave Sterrett, Compass Cryogenics Partner

www.compasscryo.com

Compass Cryogenics  110 State Road Suite 4  Sagamore Beach, MA  02562
Compass Cryogenics  333 W Trade Street Unit #1104 Charlotte, NC 28202