Continuing Education Course #167
Pipe Support Failures

1. Pipe supports are installed to:
- a. Restrain the pipe thermal movement
- b. Support the pipe dead weight
- c. Restrain the pipe from movement caused by wind and seismic events
- d. All of the above

2. Pipe supports can cause internal damage to pipe and through wall failures.
- a. True
- b. False

3. When routing and designing a piping system:
- a. Designer should route the pipe and let the piping and structural engineers support it
- b. Structural engineers should set the steel locations and piping designer should use those locations without asking for adjustments
- c. Designers should always consider potential pipe support locations when routing pipe
- d. Piping engineers should wait until the routing is complete before considering pipe supports

4. Rigid rod supports should be designed to
- a. Have length adjustment, preferably with turnbuckles
- b. Allow horizontal movement by the orientation of the pins and clevises at the steel and pipe
- c. Have lock nuts at all right handed threaded connections
- d. All of the above

5. Rigid, variable spring and constant support rod supports should be designed to stay within 4 degrees of plumb in all conditions.
- a. True
- b. False

6. TEE section sliding supports may be welded or clamped to the pipe
- a. True
- b. False

7. Supports designed to slide on support steel may bind up and rotate the support.
- a. True
- b. False

8. When a pipe is analyzed, the support should be designed for the calculated load with a safety factor, no matter what the direction of the force.
- a. True
- b. False

9. Guide steel
- a. May fail due to incomplete analysis of all loads.
- b. Can always be designed using standard tables for steel sizing based upon pipe sizes
- c. Is almost never over loaded since horizontal forces are always much less than the vertical forces
- d. Is only a design issue since guides do not need to be engineered

10. Sway struts
- a. Have tight fitting pins and bearings
- b. Are often installed in pairs
- c. Can restrain load in compression or tension
- d. None of the above
- e. All of the above

11. Hydraulic snubbers
- a. Have standard rod type pins and clevises
- b. Should be selected in favor of other types of supports
- c. Allow thermal growth of the pipe
- d. None of the above
- e. All of the above

12. Anchors should be analyzed and designed for stress and stiffness.
- a. True
- b. False

13. The load variability of a variable spring hanger refers to
- a. The load difference over the full range of the spring
- b. The load difference over the calculated movement of the spring
- c. The load difference between the travel stop installed and the travel stop removed
- d. The load difference between the empty pipe and full of fluid pipe.

14. Referring to the variable spring table in Section 5.2, if the optimum load is 450 lbs, and the movement is 1” down from ambient to operating condition
- a. The spring can could be a size 6, size 7 or size 8
- b. The spring can could be a size 6 or size 7
- c. The spring can could only be a size 6
- d. None of the above

15. If a variable spring can bottoms out, the spring has a load between 0 lbs and the rated minimum load for the spring.
- a. True
- b. False

16. When a constant support hanger is rated for 10,000 lbs, it is known that
- a. The actual load is specified to be within 500 lbs in all operating conditions
- b. The actual load will never exceed 11,000 lbs.
- c. The actual load will never be less than 9,000 lbs.
- d. None of the above.

17. Travel stops on constant support cans
- a. Are installed for shipping
- b. May be installed during hydro-static testing
- c. Should always be removed prior to commissioning a system for operation

- ○ d. None of the above
- ○ e. All of the above

18. Riser supports should be
- ○ a. Attached to the pipe using riser clamps with shear lugs
- ○ b. Avoided by welding lugs on the elbows at the top of risers
- ○ c. Attached to the pipe using pipe stanchions welded to the pipe with reinforcement pads for extra strength
- ○ d. Attached to the pipe using "Batwing" style welded plate designs

19. Riser clamps must be designed for dead weight load and
- ○ a. The load pin to load pin dimensions
- ○ b. The temperature of the pipe
- ○ c. The diameter of the pipe
- ○ d. All of the above

20. Spring supports with trapeze pipe attachments are more desirable than single rod attachments since the second rod provides more stability.
- ○ a. True
- ○ b. False