

Saudi Aramco Piping Qc Inspector Sample Interview Questions & Answers...

1. What are the main duties of the piping inspector?

Material receiving inspection ▯ Storage & preservation ▯ Cutting, assembly & fit-up ▯ Pre-welding inspection ▯ Visual inspection of socket & threaded joints ▯ Pneumatic test for reinforcing pad ▯ Pickling & passivation ▯ Database reporting ▯ Visual inspection of completed spools ▯ Piping pre-inspection & spool erection ▯ orifice flange inspection ▯ Pipe support inspection ▯ Verification of slope ▯ Internal cleanliness ▯ Valve installation ▯ Piping flange joint inspection ▯ Pre-test punch listing ▯ Hydro testing ▯ pre-commissioning.

2. How many types of gaskets do you know?

Full face (Asbestos)
Spiral wound metallic
Ring type
Metal jacketed
Inside bolt circle

3. What are the different types of mating flanges? Name the 4 most common

Flat face
Raised face
RTJ(Ring type Joint)
Tonge & groove
Male & female

4. What type of information do you get from Isometric drawings?

Line routing, Line orientation, Northing, easting & elevation, Bill of mat'l, Insulation type, NDT requirement, Revision status, Material class'n, Design, operating & testing temp/pressure, paint system, P&ID, slope, Service details, flow direction, support details, notes;

5. What type of codes and standards do you use as a piping inspector?

ASME B31.3, ASME B31.1, ASME B31.5, ASME B31.9;
JERES-A-004, JERES-A-007, JERES-A-206, JERES-A-301, JERES-L-105, JERES-L-108, JERES-L-110, JERES-L-150, JERES-L-130, JERES-L-310, JERES-L-350, JERES-L-351, JERES-W-011, JERES-W-016

6. What are the types of Valves?

Gate valve, Globe valve, Butterfly valve, Needle valve, Check valve, Control valve, Knife gate valve,
Based on function:-non-return valve, isolation valve, regulation valve, special purpose valve,

7. What are the main things you will check before Bolt torquing?

Size of bolt, Calibration of torque wrench, Manual /hydraulic require, Lubricant, Friction factor for threaded lubricant, torque value, JERES-L-109 / 351

8. Write 3 Saudi Aramco piping standards (L-Series)?

SAES-L-105, SAES-L-108, SAES-L-110, SAES-L-150, SAES-L-130, SAES-L-310, SAES-L-350, SAES-L-351

9. Write minimum ten hydrostatic test punch list items prior to commence hydrotest at site? Indicate which is YES item & NO item

1. All hot work shall be completed
2. Strainers shall be removed
3. All NDT & DT completion
4. PWHT completion
5. Adequate attachment
6. Coating on weld joint shall be removed.
7. Calibration of equipments used. Test blind MTC.
8. Test certificates of testing fluid
9. Components in new piping systems which interfere with filling, venting, draining or flushing shall not be installed. (orifice plates, flow nozzles, sight glasses)
10. All joints (flange, threaded, welded or mechanical seals) are left exposed for visual leak detection during the strength test.
11. All permanent flange joints were inspected, gasket mat'l verified & properly torqued.
12. Drains shall be provided at all low points of the piping system.
13. Vents and drain valves, both temporary and permanent, conforms with the piping class or rating.
14. Supports are installed. Additional temporary support may be installed as required.
15. Expansion joints and spring hangers or spring supports are provided with temporary restraints.
16. Arc strikes, gouges, and other indications of careless workmanship (such as surface porosity, uneven weld profiles, and undercut) shall be removed by grinding and inspected by magnetic particle or liquid penetrant method.
17. Drains are provided immediately above check valves (vertical lines)
18. All threaded joints up to the first block valve of hydrocarbon pipeline are seal welded. Thread engagement has been verified & accepted.
19. The pressure testing manifold is separately pressure tested to at least 1.2 times the system test pressure but not less than the discharge pressure of the pump used for the pressure testing.
20. Line compliance with Isometrics:
 - i. Correct Materials utilized grade/schedule (Bill of Mat'ls)

- ii. Correct flange and fittings rating
- iii. Construction tolerances per SAES-L-350

10. Which type of documents/reports attached in hydrostatic test package?

Refer Attached

11. Weep hole size shall be drilled for dummy pipe support will be _____mm

Weep hole shall be located near base plate for all vertical dummy pipe support & near run pipe at 6'O clock position for horizontal dummy.
(SAES-L-350 13.2.3 & L-310 14.7.2)

12. What is dead leg and explain?

• ~~eeeeee~~ **Dead Legs:** Piping sections that are potential for internal corrosion due to flow stagnation.

- Dead legs are created mainly by flow stagnation enhanced with presence of settled water and solid deposits.
- When the length of the section or branch , for 2 inch pipes and larger, is longer than three times its pipe diameter, or 1.22 m (4 ft) in length, the length of the dead leg is the distance measured from the outside diameter of the header (or run) to the near end of the branch valve.
- For branch connections of 1-½ inch NPS and smaller, the length of the dead leg is the distance measured from the end of the boss to the near end of the valve.

13. Write any 2 types of piping supports?

Shoe, Spring loaded, resting, weep pad,

14. Line class 103CS3C is listed on the Isometric Drawing. Explain each _____

1	03	CS	3	C
Raised face	Flange rating 300	Carbon steel	C.A-4.5mm	Caustic

As per JERES-L-105 page 375-377

15. What type of connection is acceptable for a 24" header, 12" branch?

Weldolet or welded branch with reinforcement pad as per JERES-L-110 app:A

16. How many minimum Pressure gauges to be installed during hydro test?

Two(JERES-A-004, para 7.1.5)

17. Relief valve calibration period would be _____

One week, per JERES-A-004 para 5.5.1

18. What is a PIP?

Process industry practices

19. Name the different types of Service Conditions?

NFS :- Normal services, Category M, Category D, High pressure fluid services(ASME-B31.3)

20. How do you verify (name several items to check) that the correct piping material is used?

Material specification, Pipe size, schedule, length, flange face rating, olets size rating, threaded/socket weld type, MTC, PMI report.

21. How do you identify fittings and flanges?

By material classification, size, rating, joint type (lap, socket, threaded, butt), face;

22. How do you check piping for the correct schedule?

Verify pipe material thickness by Vernier at the end or UT on surface or stenciling done by the manufacturer (visual) or heat number, traceability by MTC of product.

23. What is the standard mill tolerance for piping 2" & less?

12% of nominal wall thickness

24. What is the tolerance for ovality of piping?

5% of nominal diameter at any cross section other than weld end & 3% at weld end (JERES-L-350 para 9.2)

25. What is the difference between torqueing CS and SS bolting?

CS:- Yield strength High; Torque value High

SS:- Yield strength low; Torque value low

26. What are jackscrews and when are they required?

Used in flange joint assemblies which often require frequent separation includes orifice plate, spectacle plates, spacers, screens, and drop out spools shall be provided with jack screw to facility separation and opening for the maintenance. When flange separations are used, jackscrews are not required. Jackscrews shall be installed to be accessible from both sides of the pipe. For orifice flanges, jack screws shall be installed at 3 & 9 o' clock positions.(JERES-L-310 para 17.7)

27. What is often overlooked during orifice flange fabrication?

•Inside surface of welded joints at orifice flanges shall be ground & machined smooth (JERES-L-350 para 10.4.2)

•Orientation of taps are as per JERESD-J-0001

•All parallel pipe lines with adjacent orifice fittings shall have a min spacing of 300 mm (12 in) between flanges outside diameters if horizontal taps are required. Where this spacing is not practical follow JERESD-J-0001.

Orifice flanges in adjacent lines shall be staggered so that no two pairs of orifice flanges are less than 1 m(3ft) apart.

28. What is the maximum diameter piping allowed in hazardous service?

Socket weld:- 2" for maintenance & minor modification & 1-1/2" for new construction

Threaded:- 1-1/2" for standard fitting & valve, and 2" maximum when required for maintenance, minor field minor modification of existing piping system(JERES-L-110 para 7.2)

**29. What is the minimum sized piping that can be installed on pipe racks?
Ø1"**

**30. Can Teflon tape be used prior to seal welding?
No, (JERES-L-110 para 8.5)**

**31. How many threads can be visible after seal welding threaded joints?
No, should cover all exposed threads(JERES-W-011 para 12.15.3)**

**32. What is the gap requirement for socket welds for new construction?
1.5mm-3mm (ASME B31.3 fig 328.5.2C)**

**33. Give examples of unique support details that allow piping freedom of movement for thermal expansion?
Guide support, Moving saddle support, Expansion ballons, shoe support, Spring loaded**

**34. When you will apply 24 hours recorded hydro test?
If for justifiable safety reasons the UG line must be backfilled, then the joints shall remain exposed during testing, otherwise the test shall be a 24 hour recorded test.(JERES-L-150 para 7.4.2)**

**35. Difference between carbon steel and stainless steel?
CS:- Low cost, no chromium content, suitable for non-corrosive service upto 350 degree C, max carbon 0.3%.
SS:- Contains more than 12% Cr, 0.08% C, Suitable for corrosive, cryogenic, High temp services, costly.**

**36. Difference between RT & UT?
RT:- Uses X-ray or Gamma ray to detect discontinuities, reveals mostly volumetric. planar defects & subsurface defects not detectable easily
UT:- Uses ultrasonic beam to detect discontinuities reveals both planar & volumetric defects, but size & exact location of defects are not easily identifiable. Possible only on materials that do not deflect UT waves.**

**37. Difference between PT & MT?
MT:- Only Applicable for ferromagnetic materials & able to detect both surface & subsurface discontinuities, compare to PT examination it takes less time for testing & inspection; Applicable for large temp range.**

PT:- Applicable for both ferromagnetic & non ferromagnetic materials & able to detect only surface discontinuities, It requires more time; Applicable for small temp range.

38. How do you control material in fabrication shop?

- 1) All materials shall have material spec and grade stamped or stenciled & clearly marked with permanent marker.
- 2) All materials, heat no. will be made traceable to MTC from approved vendor & no material substitution will be done without proper approval from the company.
- 3) All materials shall be stored & stacked separately as per material grade.
- 4) Heat no. shall be transferred before cutting into pipes that have to be cut.
- 5) All materials shall be color coded as per traceability procedure

39. Write inspection items during valve installation?

1. Valve type corrects at the location
2. Valve test certificate
3. Valve tag as per P&ID
4. Valve direction of flow as per P&ID
5. Gasket bolts as per isometric & type
6. Handle direction
7. Chain wheel installed
8. **Valve flange face condition**