AWS-CWI Part-C: API 1104 (22nd Ed.) Practice Questions

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Exam Overview

- **Subject:** Welding of Pipelines and Related Facilities (API 1104 22nd Edition)
- **Format:** Open Book
- **Objective:** To master the navigation of the codebook and understand technical rationales for Part-C of the CWI exam.

Practice Question Bank

Section 1: Radiographic Testing & IQIs

1. When using a source inside the pipe (SWE/SWV), what is the minimum number of IQIs required for a complete weld?

- A) 1
- B) 2
- C) 3
- **D) 4**
- **Answer Rationale:** Per **Clause 11.1.6 (a)**, a minimum of four IQIs must be used and spaced approximately equally around the circumference for a complete weld.
- **Code Reference:** API 1104, Page 77.

2. According to Table 19, what is the identifying number and essential hole for a 0.750 in. thick weld?

- A) 17 / 2T
- **B) 20 / 2T**
- C) 25 / 2T
- D) 30 / 2T
- **Answer Rationale:** Table 19 specifies that for material thicknesses > 0.500 to 0.750 in., the ID number is 20 and the essential hole is 2T.
- **Code Reference:** API 1104, Page 77.

Section 2: Repair Procedures & Authorizations

3. Which of the following always requires company authorization before a repair can begin?

- A) Porosity repair
- B) Slag repair
- **C) Crack repair**
- D) Grinding repair
- **Answer Rationale:** Per **Clause 10.2.1 (a)**, specific company authorization is a mandatory requirement prior to any crack repair.
- **Code Reference:** API 1104, Page 57.

Section 3: Procedure Qualification (WPS)

4. When qualifying a WPS using two different SMYS materials, the procedure is qualified to weld joints where:

- A) Both base materials are ≤ the lowest used.
- **B) One base material is ≤ the lowest used, and the other is ≤ the maximum used.**
- C) Both base materials are ≥ the maximum used.
- D) Only the exact same material combination is used.
- **Answer Rationale:** Per **Table 1, Clause 5.4.2.2 (a)**, qualification is valid if one base material is ≤ the lowest used and the other is no greater than the maximum used.
- **Code Reference:** API 1104, Page 20.

Section 4: Destructive Testing & Acceptance

5. What is the maximum allowable dimension for any single gas pocket in a Nick Break specimen?

- A) 1/32 in. (0.8 mm)
- **B) 1/16 in. (1.6 mm)**
- C) 1/8 in. (3 mm)
- D) 1/4 in. (6 mm)
- **Answer Rationale: Clause 5.6.3.3** states that the greatest dimension of any single gas pocket shall not exceed 1/16 in. (1.6 mm).
- **Code Reference:** API 1104, Page 26.

6. If a requirement is not specifically addressed in API 1104, it should be:

- **A) Addressed using sound engineering judgment**
- B) Automatically rejected

- C) Approved without formal review
- D) Considered strictly prohibited
- **Answer Rationale: Clause 1** explicitly states that the absence of guidance is not prohibitive if based on sound engineering judgment.
- **Code Reference:** API 1104, Page 1.

Section 5: Mechanized Welding

7. How long must the record of a mechanized procedure qualification be maintained?

- A) 3 years
- B) 5 years
- C) 10 years
- **D) As long as the procedure is in use**
- **Answer Rationale:** Per **Clause 12.3**, records must be maintained as long as the procedure remains in use.
- **Code Reference:** API 1104, Page 95.

8. For a mechanized weld diameter > 12.750 in., how many additional specimens replace a single failed bend test?

- A) 1
- **B) 2**
- C) 3
- D) 4
- **Answer Rationale:** Per **Clause 12.6.3.3**, a single failed bend specimen should be replaced by two additional specimens from adjacent locations.
- **Code Reference:** API 1104, Page 107.

Section 6: Annex A (Fracture Mechanics)

9. For Annex A, a change in heat input is an essential variable if it exceeds the nominal range by more than:

- A) ± 5%
- **B) ± 10%**
- C) ± 20%
- D) ± 25%

- **Answer Rationale:** Per **Table A.1, Clause A.3.2.10 (b)**, a change exceeding ± 10% from the nominal heat input is considered an essential variable.
- **Code Reference:** API 1104, Page 117.

10. Option 1 procedures are specifically limited to welds with a CTOD toughness equal to or greater than:

- A) 0.002 in. (0.05 mm)
- **B) 0.004 in. (0.10 mm)**
- C) 0.010 in. (0.25 mm)
- D) 0.020 in. (0.50 mm)
- **Answer Rationale:** Per **Clause A.5.1.2**, Option 1 is restricted to CTOD toughness values ≥ 0.004 in. (0.10 mm).
- **Code Reference:** API 1104, Page 123.
