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API API-SIEE

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Topic Break Down

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QUESTION NO: 1

According to NEMA ICS 2, a provision for pad locking shall be provided:

A. on the door to prevent opening the combination starter door.

B. on the external operating handle.

C. on the wireway to prevent opening the wireway on the motor control center.

D. on the rear door of the low voltage motor control center.

ANSWER: B

Explanation:

on the external operating handle. NEMA ICS 2 addresses industrial control and motor-control equipment, including the construction and operating features of enclosed controllers and combination starters. The required padlocking provision is associated with the externally accessible operating handle because that handle operates the disconnecting means. Providing padlock capability at this location permits the disconnect to be secured in its intended isolated position before an enclosure is opened or maintenance begins. This design supports an orderly lockout process by giving personnel a visible, accessible means to prevent operation through the normal external control mechanism.

For source inspection, verification should include confirming that the external handle incorporates the specified padlock provision and that it functions as supplied on the equipment. The inspector should also verify the feature against the purchaser's specification, approved drawings, and the applicable edition of the referenced standard. This is particularly important for combination starters and motor-control assemblies, where isolation and prevention of unexpected energization are essential personnel-safety considerations. NEMA identifies ICS 2 as its standard for industrial control and systems controllers; its scope and publication information are available through the NEMA ICS 2 standard page. The safety purpose of lockout is also consistent with OSHA's control of hazardous energy requirements.

QUESTION NO: 2

When a deviation from specifications, drawings, codes, or standards is identified, the source inspector should FIRST treat it as:

A. a supplier observation only

B. a schedule note

C. a nonconformance

D. a warranty issue

ANSWER: C

Explanation:

a nonconformance is correct because a departure from an applicable purchase specification, approved drawing, code, or standard must first be identified and controlled as a failure to meet a specified requirement. The source inspector's initial responsibility is to objectively document the condition, identify the requirement involved, notify the appropriate supplier and purchaser representatives as required by the inspection and test plan, and ensure the item is not accepted on the basis of an unapproved deviation. This approach preserves traceability and allows the responsible technical authority to evaluate the condition and determine an authorized disposition, such as correction, repair, use-as-is, or rejection. The inspector does not independently redesign the item or authorize a technical concession unless that authority has been explicitly delegated. Treating the issue as a nonconformance also supports clear quality records, including a nonconformance report when required by the project's quality system or contractual documents. API source-inspection guidance emphasizes verification of conformance to governing requirements and appropriate reporting of nonconforming conditions. See API's Recommended Practice 588 information and API's standards and publications resources.

QUESTION NO: 3

According to API 541, determination of efficiency and power, locked-rotor current, power factor, torque, full-load current and slip are some of the tests verified when performing a:

A. complete test.

B. compliance test.

C. design test.

D. routine test.

ANSWER: A

Explanation:

complete test. is correct because the listed determinations comprise core motor performance characteristics that must be established through a comprehensive performance evaluation. Efficiency and input power establish operating energy performance; power factor and full-load current confirm electrical operating behavior at rated load; and torque, locked-rotor current, and slip verify starting and load-related characteristics. Together, these values provide the information needed to confirm that a motor meets the specified guaranteed performance and starting requirements rather than merely demonstrating that it has passed basic production checks.

API 541 applies to form-wound squirrel-cage induction motors used in severe petroleum and chemical-service applications. Its testing requirements distinguish a complete test by the breadth of performance data determined for the motor. The measurements in the question align with recognized induction-motor test practices, including the determination of efficiency, current, torque, power factor, and slip under defined operating conditions. These test results support verification of the motor's rated and starting performance before acceptance for the intended service. API's standards program is available at API Standards, and the closely related industry methodology for polyphase induction-motor testing is described by IEEE Standard 112.

QUESTION NO: 4

Which information should be included at a minimum in a source inspection report?

A. Inspector's travel reimbursement total

B. Reference drawings/data used, including drawing numbers

C. Supplier profit margin

D. Internal purchaser budget code only

ANSWER: B

Explanation:

Reference drawings/data used, including drawing numbers should be included because a source inspection report must create a clear, traceable record of what was inspected and the technical basis used to determine conformity. Identifying the applicable drawings, specifications, data sheets, procedures, purchase-order requirements, and their document or drawing numbers lets the purchaser, supplier, and subsequent reviewers verify exactly which revision-controlled requirements supported the inspection findings. This traceability is essential when evaluating dimensions, materials, test results, electrical characteristics, workmanship, nonconformances, or release status. It also allows a later reviewer to reconcile the report with the supplier's manufacturing and quality documentation without relying on undocumented assumptions. API source-inspection guidance emphasizes documenting inspection activities, observations, results, and relevant supporting records so that the report provides an accurate and usable record for the purchaser. For electrical equipment, the cited technical data are particularly important because acceptance may depend on equipment-specific drawings, data sheets, test procedures, and certification records. API's Source Inspector Electrical Equipment certification program is intended for personnel who apply this disciplined documentation and quality-surveillance approach. See API's Source Inspector Electrical Equipment certification information and its standards and publications resources.

QUESTION NO: 5

Metallic shielding components such as tapes, wires, or braids shall be connected to a:

A. equipment grounding busbar.

B. low voltage ceramic insulator.

C. low voltage connector.

D. center tap of a transformer.

ANSWER: A

Explanation:

equipment grounding busbar. is correct because metallic cable shielding—including tapes, drain wires, concentric wires, and braids—must be bonded to the equipment grounding/earthing system at the designated grounding point specified by the applicable design and installation requirements. This bonding establishes a dependable, low-impedance path for induced and fault-related currents and keeps exposed conductive parts at substantially the same electrical potential. It also supports the shield's intended electromagnetic-compatibility function by providing a controlled path for interference currents rather than allowing those currents to affect connected equipment or instrumentation.

For source inspection, the grounding busbar is a recognizable, engineered termination point that permits verification of the shield connection, bonding hardware, conductor continuity, and compliance with approved wiring drawings and cable-termination details. The connection should be mechanically secure, electrically continuous, protected from corrosion, and made in accordance with the project's grounding design. Proper grounding and bonding are fundamental electrical-safety practices addressed by OSHA's grounding requirements and by NFPA electrical-safety resources. See OSHA 29 CFR 1910.304, Wiring Design and Protection and NFPA Electrical Safety.

QUESTION NO: 6

According to IEEE 841, terminal boxes for voltages above 1000 V or for frame sizes exceeding 449T at 1000 V shall be provided with:

A. integrally designed grounding lugs.

B. permanent locking mechanism.

C. corrosion-resistant replaceable automatic drainage fitting.

D. corrosion-resistant non-sparking coating.

ANSWER: B

Explanation:

permanent locking mechanism. is correct. IEEE 841 establishes severe-duty requirements for premium-efficiency, totally enclosed squirrel-cage induction motors used in petroleum and chemical-industry applications. The terminal box is a critical personnel-protection boundary because it encloses energized conductors and terminations. For motors above 1,000 V, as well as larger-frame 1,000 V motors, the standard requires a permanent locking mechanism for the terminal-box cover. This construction helps ensure that access is controlled and that the cover remains securely closed during operation, vibration, maintenance activity, and other demanding industrial-service conditions. "Permanent" is important: the locking feature is an integral, durable part of the terminal-box arrangement rather than a temporary field practice or an optional accessory. This requirement supports safe control of access to potentially hazardous electrical terminations while retaining the robust enclosure characteristics expected for IEEE 841 motors. The governing requirements should be applied using the applicable edition of IEEE 841 and the motor purchase specification. See the IEEE standard listing for IEEE 841 and IEEE's overview of its standards program.

QUESTION NO: 7

What is the interrupting rating of a piece of equipment?

A. The peak current rating that a device has been certified to interrupt

B. The symmetrical current rating that a device has been certified to safely interrupt

C. The crest current rating that a device has been certified to safely interrupt

D. The load current rating that a device has been certified to interrupt

ANSWER: B

Explanation:

The symmetrical current rating that a device has been certified to safely interrupt is correct. An interrupting rating expresses the maximum available fault current that a protective device, such as a circuit breaker or fused switch, can interrupt safely at its specified rated voltage and test conditions. In AC power-system applications, this capability is commonly stated as an RMS symmetrical current value because that is the standardized basis used to compare fault duty with the equipment's tested performance.

This rating is a fundamental application and inspection datum. The available short-circuit current at the equipment location must not exceed the interrupting rating marked on the device or assembly. Confirming this relationship helps ensure that, if a fault occurs, the protective equipment can open the circuit without unacceptable damage or hazards. The rating must also be considered together with the applicable voltage rating and the manufacturer's listed conditions of use; a current rating alone is not sufficient for a safe application.

For terminology and installation requirements, see the National Electrical Code definition and requirements addressing equipment interrupting ratings in NFPA 70, National Electrical Code. Additional technical background on applying low-voltage circuit breakers is available from Eaton's molded-case circuit breaker application guide.

QUESTION NO: 8

Which item is part of typical final inspection and shipping preparation for a liquid-immersed transformer?

A. Verification that all FAT issues are resolved

B. Reclassification of the project risk register

C. Reissue of procurement bid tabs

D. Elimination of all documentation requirements

ANSWER: A

Explanation:

Verification that all FAT issues are resolved is a normal and essential final-inspection activity before a liquid-immersed transformer is released for shipment. A factory acceptance test (FAT) confirms that the completed transformer has been inspected and tested against the approved specification, drawings, and applicable standards. If testing, inspection, or document review identifies a nonconformance, it should be recorded, evaluated, corrected where required, and formally closed before final acceptance. The inspector's final review commonly confirms that corrective actions and punch-list items have been completed, test records are acceptable, the transformer configuration matches the purchase requirements, and shipping-related protections are in place. This closure provides traceability that the equipment being dispatched is the same equipment that successfully completed the required quality controls. It also prevents unresolved manufacturing or test discrepancies from being transferred to the installation site, where correction can be more difficult, costly, and disruptive. IEEE transformer requirements provide the technical framework for transformer design, testing, and acceptance, while source-inspection practice relies on documented verification and disposition of identified issues before release. See IEEE Std C57.12.00, Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers and API Standards.

QUESTION NO: 9

Circuit breakers over 1000 V equipped with stored energy mechanisms shall perform which of the following functions?

A. Indicate whether power is available to the circuit breaker

B. Identify the presence of fault current flow through the circuit breaker

C. Locate the position of the charging mechanism

D. Prevent the release of the stored energy unless the mechanism has been fully charged

ANSWER: D

Explanation:

Prevent the release of the stored energy unless the mechanism has been fully charged is correct. A stored-energy operating mechanism, commonly spring-operated, must complete its charging cycle before its energy can be released to operate the medium-voltage circuit breaker. This requirement ensures that the mechanism has sufficient, known energy available to carry out the required closing or opening stroke at the designed operating speed and contact force. The associated mechanical or electrical interlock prevents a partial or unpredictable operation caused by releasing incompletely stored energy.

This function is particularly important during commissioning, maintenance, and remote operation because dependable breaker operation is fundamental to safely isolating equipment and interrupting system faults. Source inspectors should verify the mechanism's charging and release interlocks through manufacturer documentation, functional testing, and applicable project acceptance records. The requirement aligns with the safety and functional design principles applied to metal-enclosed medium-voltage switchgear and high-voltage circuit breakers, including the operating-mechanism provisions addressed by IEEE C37.20.2 and the circuit-breaker requirements covered by IEC 62271-100. A fully charged-only release arrangement provides a controlled, repeatable operation and preserves the breaker's specified interrupting and switching capability.

QUESTION NO: 10

What standard is used for the installation of signaling and communications conductors, equipment, and raceways?

A. IEC 20047

B. NEMA 250

C. NFPA 70

D. IEEE C37.20.2

ANSWER: C

Explanation:

NFPA 70 is correct because it is the National Electrical Code (NEC), the principal U.S. code governing safe electrical installation practices. Its scope covers electrical conductors and equipment installed in or on premises, including the wiring methods and raceways used with communications and signaling systems. The NEC contains dedicated requirements for communications circuits and cables, particularly in Article 800, and related requirements for signaling circuits appear in other applicable articles, such as those addressing fire alarm systems. These rules address practical installation matters including cable and conductor routing, raceway use, grounding and bonding, protection from physical damage, separation from power conductors where required, and termination practices. Therefore, when inspection documentation calls for compliance with the governing installation code for signaling or communications conductors, associated equipment, and raceways, NFPA 70 is the applicable standard. For source inspection, this provides the code framework for confirming that the specified installation-related materials and methods meet the project's applicable electrical safety requirements and the adopted code edition. NFPA identifies NFPA 70 as the National Electrical Code and provides access to the standard through its codes portal: NFPA 70 standard information. The NEC's scope and code-access resources are also available at NFPA 70 code listing.

QUESTION NO: 11

A visual inspection includes verification of all the following except:

A. that line drawings match equipment.

B. equipment grounding.

C. nameplate data.

D. a Point-to-Point test.

ANSWER: D

Explanation:

a Point-to-Point test. is the correct answer because point-to-point verification is an electrical test activity rather than a visual-inspection activity. It requires tracing conductors and confirming that each wire terminates at the intended device terminal according to the applicable drawings, schedules, and connection requirements. This work may involve continuity-test instruments, test leads, or documented circuit checks; it cannot be completed solely by observing the installed equipment. In contrast, a visual inspection is based on observable installation features and documentation comparison, such as whether equipment identification and nameplate information are present and legible, whether grounding and bonding connections appear properly installed, and whether the equipment arrangement corresponds with the relevant line drawings. Separating visual examination from functional and continuity testing is important because each inspection method has a distinct purpose, required level of evidence, and documentation record. API electrical-inspection guidance is administered within API's standards program, which provides industry requirements and recommended practices for petroleum and petrochemical facilities. See the API Standards program and API's standards announcements for official standards information and current publication status.

QUESTION NO: 12

What electronic instrument is used for measuring electrical potential difference between two points in an electric circuit?

A. Amp meter

B. Wheatstone bridge

C. Voltmeter

D. Potentiometer

ANSWER: C

Explanation:

Voltmeter is correct because voltage is the electrical potential difference between two points. A voltmeter is specifically designed to measure that difference and is connected in parallel across the two points, terminals, or component under test. In practice, a modern digital multimeter set to the appropriate AC- or DC-voltage function performs the same measurement. The instrument is selected with a voltage range and measurement category suitable for the circuit being evaluated, and its probes are placed at the relevant points without intentionally creating a conductive path between them. For electrical equipment inspection and testing, confirming voltage is important when verifying that a supply, control circuit, terminal block, or equipment input is energized and operating at the specified rated value. The U.S. National Institute of Standards and Technology describes voltage as electrical potential difference and identifies the volt as its SI unit. OSHA's electrical-safety guidance also emphasizes using properly rated test equipment when testing circuits. See NIST: SI Units for Electricity and Magnetism and OSHA: Electrical Safety.

QUESTION NO: 13

The insulation resistance test uses what type of applied voltage?

A. AC

B. DC

C. Half-wave pulsating

D. Full-wave rectified

ANSWER: B

Explanation:

DC is correct because insulation-resistance testing is performed by applying a specified direct-current test voltage across the insulation and measuring the resulting very small leakage current. The tester then calculates resistance using Ohm's law. A stable DC voltage is important because insulation systems, cables, windings, and connected equipment have capacitance; once that capacitance charges, the remaining current provides meaningful information about conduction through or over the insulation. DC testing also permits observation of time-dependent insulation behavior, such as dielectric absorption and polarization index measurements where applicable. Test instruments commonly called megohmmeters or insulation-resistance testers therefore provide regulated DC test voltages selected for the equipment and applicable procedure, such as 250 V, 500 V, 1,000 V, or higher. The voltage level must be chosen carefully so it is appropriate for the equipment's rating, condition, and governing inspection or maintenance requirements, and the equipment must be discharged after testing because stored capacitive energy may remain. Fluke's overview of the method describes applying DC voltage and measuring leakage current to determine insulation resistance: Fluke: Insulation resistance testing. Megger likewise identifies insulation testing as a DC test and discusses its application to electrical assets: Megger: Insulation testing.