PRACTICE EXAM 8

NCCCO Core Written Exam Simulation — 90 Questions

Time Allowed: 90 Minutes | Format: Multiple Choice | Passing Score: 70% (Scaled)

Answer all 90 questions. Do not leave any question blank. Record your answers on a separate sheet before checking the answer key.

DOMAIN 1: SITE WORK

Questions 1–18

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1. A structural engineer's report confirms a concrete slab can support 2,200 psf uniform loading. The crane's outrigger reaction will produce 3,600 psf under each pad. What must happen before setup proceeds?

A. A structural engineer must evaluate the slab specifically for the concentrated outrigger point loads before the crane is placed

B. Increase the outrigger pad size until contact pressure drops to within the slab's confirmed 2,200 psf uniform rating

C. Obtain verbal confirmation from the original slab designer that the uniform rating covers concentrated crane loads

D. Proceed at 75% of rated capacity to proportionally reduce the outrigger reaction within the confirmed rating

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2. A controlling entity provides written ground condition documentation. The operator observes standing water pooled near two outrigger positions that the documentation does not address. What is the operator's obligation?

A. Accept the documentation — written controlling entity confirmation satisfies OSHA 1926.1402 regardless of field observations

B. Photograph the standing water for liability protection and proceed — the controlling entity bears regulatory responsibility for documentation accuracy

C. Raise the unaddressed condition with the controlling entity before proceeding — field observations not covered by documentation must be resolved before setup

D. Request revised documentation specifically addressing the water — once revised documentation is received, proceed without further evaluation

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3. A burst water main 40 feet away is discharging rapidly toward the crane's outrigger area. A pick is in progress with the load at working height. What is the correct immediate action?

A. Complete the current pick cycle as quickly as possible, then stop and evaluate ground conditions

B. Land the load at the nearest safe position immediately and do not resume until ground conditions are evaluated

C. Continue the pick while monitoring outrigger pads for visible movement or settlement

D. Notify the lift director and maintain load position until the water source is confirmed shut off

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4. A soil investigation identifies loose water-saturated sand at 8-foot depth beneath medium-dense gravel from grade to 8 feet. What specific risk does this profile present for crane operations?

A. Vibration and dynamic loading from crane operations can trigger liquefaction in the saturated sand layer, causing sudden catastrophic loss of support without progressive warning

B. Long-term creep settlement under sustained outrigger loads is the primary concern — sudden failure is unlikely with this profile

C. The gravel layer provides an adequate bearing stratum that isolates the crane from the deeper saturated sand

D. Surface drainage must be improved to prevent additional water from reaching the sand layer before operations begin

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5. Under OSHA 1926.1409 Table A, what is the minimum approach distance for crane operations near energized power lines rated at 50 kV or below?

A. 5 feet — the reduced minimum for distribution-level voltages at or below 50 kV

B. 15 feet — the standard minimum for all lines between 25 kV and 75 kV

C. 20 feet — the OSHA baseline minimum for all energized lines regardless of voltage

D. 10 feet — the minimum approach distance for lines rated at 50 kV or below under OSHA 1926.1409

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6. An operator inspects the planned setup area and finds numerous small circular depressions 3 to 6 inches in diameter scattered across the outrigger positions. What action is required before setup proceeds?

A. No action — small circular depressions are normal surface drainage features in compacted soil areas

B. A qualified person must investigate the cause before setup — circular depressions can indicate subsurface void development that may cause ground failure under outrigger loads

C. Place timber mats over the depression area to bridge any shallow voids and proceed with setup

D. Confirm the depressions are not deeper than 4 inches — depressions within this range are within acceptable surface tolerance for crane operations

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7. A site history shows underground fuel storage tanks were removed and the excavations backfilled 15 years ago. What concern does this history create for crane setup?

A. Residual fuel contamination in the backfill requires soil remediation before any crane operations can proceed at this location

B. Fifteen years of consolidation is sufficient for backfill to achieve bearing capacity equivalent to undisturbed native soil

C. Tank removal backfill may have lower bearing capacity and non-uniform conditions compared to surrounding undisturbed soil — a geotechnical evaluation is needed to confirm the actual capacity

D. The documented removal satisfies the controlling entity's disclosure requirement — no additional geotechnical evaluation is needed

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8. A crane is set up on a paved surface when the operator notices a 2-inch-wide crack running directly beneath the right-rear outrigger pad. The crack runs parallel to the direction of the planned lift. What must the operator do before lifting?

A. Have a qualified person evaluate the crack before lifting — a structural crack at an outrigger location may indicate compromised capacity and must be assessed before load is applied

B. Reposition the pad 6 inches away from the crack and proceed — the relocation moves the load away from the weakened area

C. Confirm the crack does not extend below the surface layer and proceed if it appears superficial

D. Document the crack with photographs and monitor it during the first three picks before deciding on further action

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9. Under OSHA 1926 Subpart CC, which of the following is the controlling entity specifically required to disclose before crane setup when the information is known?

A. The results of any soil bearing capacity tests conducted on the site within the previous 24 months

B. The names and license numbers of all underground utility owners with infrastructure in the work area

C. A written certification that the ground has been independently inspected and confirmed safe for crane operations

D. The location of underground utilities, known or suspected subsurface conditions, and the proximity of structures that may affect crane operations

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10. A crane is operating adjacent to a 10-foot-deep open excavation with no shoring. The nearest outrigger is 6 feet from the excavation edge. The soil is silty clay. What is the primary concern with this configuration?

A. The 6-foot setback is below the OSHA minimum of 8 feet required from any unshored excavation edge

B. Outrigger loads near an unshored excavation edge increase shear stress in the slope and can trigger wall collapse — the setback must be evaluated by a qualified person based on the soil type, excavation geometry, and outrigger loads

C. Silty clay excavations are self-supporting to 10 feet and do not require setback evaluation for crane operations

D. The concern is limited to boom tip clearance over the excavation during the swing portion of the lift

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11. A crane has been set up and leveled. During the first pick of the day, the operator notices the crane has gone 0.8 degrees out of level — the manufacturer's tolerance is 0.5 degrees. The load is now suspended at working height. What must the operator do?

A. Land the load immediately — operating beyond the manufacturer's levelness tolerance means the load chart values being used are no longer valid; the load must be set down and the crane re-leveled before any further picks

B. Continue the pick and re-level after setting the load — a 0.3-degree exceedance is within operational tolerance during active lifting

C. Reduce subsequent picks to 80% of rated capacity to compensate for the level deviation until re-leveling can occur

D. Monitor the level reading during the swing — if the reading stabilizes before the set point, the pick can be completed

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12. A utility locate marks a 6-inch high-pressure gas main running diagonally across the planned crane setup area at 2.5-foot depth. The controlling entity proposes placing 4-inch timber mats over the line and proceeding. What must occur before this approach is accepted?

A. The utility owner must be notified of the crane setup — notification alone satisfies the requirement for working near marked high-pressure gas lines

B. The lift director must authorize the matting approach in writing — written lift director authorization satisfies the engineering review requirement for utility proximity

C. A structural engineer or the utility owner must confirm the gas main can structurally support the anticipated outrigger loads before any crane is positioned over it — timber mats distribute surface load but do not change what the pipe must support

D. Two layers of timber mats must be used instead of one — double matting automatically satisfies the load distribution requirement for 6-inch gas mains at 2.5-foot depth

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13. A crane operator is directed to set up in an area the controlling entity describes as "previously used for light industrial storage." No soil investigation has been performed. What is the specific concern with proceeding on this description alone?

A. Light industrial storage sites are classified as contaminated — EPA authorization is required before crane operations can begin

B. "Previously used for light industrial storage" does not confirm soil conditions — buried foundations, compacted fill, or subsurface debris may be present and the description does not constitute verified ground condition information

C. The area description satisfies the controlling entity's disclosure obligation under OSHA 1926.1402 — no further investigation is required

D. Industrial storage areas are typically paved — the operator should request confirmation of paving thickness before proceeding

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14. A crane is being positioned near a hillside where the slope rises sharply behind the rear of the machine. Heavy rain occurred two days ago. What specific concern does this combination of factors create?

A. Cranes positioned with a slope rising behind the rear are at risk of counterweight contact with the hillside during the lift

B. Rainwater infiltration near the slope toe can soften the soil supporting the rear outriggers — combined with the added surcharge of the slope mass above, the rear outrigger bearing capacity may be significantly lower than pre-rain conditions

C. Rain increases atmospheric moisture, which reduces LMI sensor accuracy — wait 24 hours after rain before making critical lifts

D. Slopes rising behind the crane create wind shadow zones that can cause unpredictable gusting at the boom tip

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15. Under OSHA 1926 Subpart CC, when an operator encounters an unmarked buried utility during crane setup, what is the required immediate action?

A. Stop setup operations immediately, protect the area, and notify the controlling entity — operations in the area must not resume until the utility is identified, its status confirmed, and the controlling entity has provided guidance on how to proceed safely

B. Visually inspect the utility to identify its type and proceed if it appears inactive or abandoned

C. Contact the one-call center to initiate an emergency locate and wait for the utility owner's response before proceeding

D. Document the discovery and continue setup while the controlling entity investigates — the operator's documentation protects against liability

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16. A crane is set up on a construction site in freezing temperatures. At the start of the shift the ground is frozen solid and confirmed adequate. By midday, temperatures have risen above freezing. What concern must the operator manage?

A. Frozen ground bearing capacity is permanent — once confirmed adequate at the start of shift, the rating remains valid regardless of temperature changes during the day

B. Hydraulic fluid viscosity changes with temperature — the capacity concern is limited to crane function, not ground conditions

C. Frozen ground can lose bearing capacity rapidly as it thaws — capacity that was confirmed in the morning may be significantly reduced by midday; outrigger conditions must be re-evaluated as temperatures rise and thawing progresses

D. The freeze-thaw cycle only affects the top 2 inches of soil — outrigger pads distribute load below this zone and are unaffected by surface thawing

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17. A job site is located on reclaimed land that was formerly a tidal marsh. The fill was placed 20 years ago and the surface appears stable. What geotechnical concern is most relevant to crane setup planning?

A. Reclaimed marsh land requires a coastal construction permit before any crane operations can proceed

B. Marsh fill placed over organic soils commonly contains layers of peat or soft clay that have not fully consolidated — these layers can have very low bearing capacity and high compressibility even decades after filling; a geotechnical investigation is essential before crane setup

C. Twenty years of consolidation is sufficient for reclaimed marsh fill to achieve stable bearing capacity equivalent to natural upland soils

D. The primary concern is corrosion of crane components from residual salt content in the former marsh soil

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18. An operator is setting up a crane on a site adjacent to an active railroad. The railroad right-of-way boundary is 15 feet from the nearest planned outrigger position. The crane's counterweight swing radius in the planned configuration is 18 feet. What must happen before operations begin?

A. Notify the railroad company — notification alone is sufficient when the outrigger is positioned outside the right-of-way boundary

B. Restrict all picks to the side of the crane away from the railroad — directional restriction eliminates the counterweight encroachment concern without requiring railroad coordination

C. Confirm that no crane component including the counterweight can enter the railroad's clearance envelope at any point during operations — if the counterweight swing extends into the right-of-way, the railroad must be contacted and operational restrictions established before any crane movement

D. Position a spotter between the crane and the railroad track — spotter presence satisfies the proximity requirement for railroad adjacency

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DOMAIN 2: OPERATIONS

Questions 19–41

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19. An operator completes the pre-shift inspection and finds the load line wire rope has a section with four broken wires within a single lay length. The crane uses 6-strand rope. What action is required before lifting begins?

A. Remove the rope from service — four broken wires in one lay length of 6-strand rope meets the ASME B30.5 removal threshold of six broken wires in one lay length — wait, four does not meet six; however, concentration of four breaks in a single lay length indicates severe localized deterioration warranting removal under the apparent damage criterion even though the numerical threshold has not been reached

B. Mark the location, reduce all picks to 80% of rated capacity, and re-inspect after 20 operating hours

C. Continue operations — four broken wires in one lay length is below the six-wire removal threshold for 6-strand rope under ASME B30.5

D. Continue operations but report the finding to the next shift operator for monitoring

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20. A crane operator is performing a lift when the load begins rotating slowly. The wire rope being used is standard 6-strand rope, not rotation-resistant construction. What is the most appropriate initial response?

A. Apply a slight swing input opposite the rotation direction to counteract the load spin

B. Increase hoist speed to bring the load to the set point before the rotation worsens

C. Stop hoisting, hold the load stable, and assess whether the rotation is progressing — slow rotation under load with standard rope may indicate developing core damage or torque imbalance requiring rope inspection

D. Lower the load back to grade and switch to rotation-resistant rope before continuing the pick

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21. Under OSHA 1926.1417, which of the following is a condition that must be met before the operator may leave the crane cab at the end of a shift?

A. The lift director must be present and have confirmed acceptance of crane custody before the operator departs

B. All loads must be fully landed, all rigging released from the hook, all controls in the off or neutral position, all brakes applied, and all locking devices engaged

C. The crane must be positioned with the boom at the manufacturer's recommended storage angle before the operator departs

D. A post-shift inspection must be completed and signed before the operator is released from duty

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22. A crane operator notices during a pick that the hoist drum is spooling rope unevenly — the rope is piling up on one side of the drum rather than distributing across the full drum width. The load is 12 feet off the ground. What is the correct response?

A. Continue the pick — uneven spooling is a cosmetic issue that does not affect the load line's rated capacity

B. Slow the hoist speed to allow the rope to redistribute across the drum before continuing to working height

C. Complete the pick and report the uneven spooling during the post-shift inspection for maintenance attention

D. Land the load immediately — uneven rope spooling causes rope to cross and ride over previous wraps, crushing the inner layer and damaging the rope at the crossover points; the condition must be investigated before further picks

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23. A signal person gives a hoist-up signal while the operator can see a rigger's hand is still positioned inside the hook throat. No stop signal has been given. What must the operator do?

A. Stop immediately and not move any crane function — the operator's direct observation of an imminent danger overrides the signal received; the operator does not need a stop signal to stop when they personally observe a life-safety hazard

B. Follow the signal — the signal person has visual authority over the lift and their hoist-up signal confirms they have verified all personnel are clear

C. Sound the horn to alert the rigger and then follow the hoist-up signal at reduced speed

D. Hold position and wait for the signal person to re-confirm the signal before hoisting

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24. A crane is picking a load that the rigging crew described as 28,000 pounds. At lift-off, the LMI reads 94% of rated capacity. The pre-lift calculation projected the pick at 76%. What is the correct response?

A. Continue — a 18-point LMI discrepancy is within the instrument's acceptable field tolerance range

B. Slow hoist speed and monitor the LMI — if it stabilizes below 100% the pick may continue to working height

C. Lower the load to the ground immediately — the 18-point gap between projected and actual LMI reading indicates the actual hook load is significantly greater than the 28,000 lb estimate; the load weight and radius must be verified before any further attempt

D. Reset the LMI to the projected 76% value and continue — the pre-lift calculation is more accurate than the LMI at low hook heights

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25. An operator is performing repetitive picks when the swing function begins requiring noticeably more handle pressure to initiate movement than it did at the start of the shift. Operating conditions have not changed. What must the operator do?

A. Increase engine RPM to restore hydraulic flow and pressure — reduced swing responsiveness at consistent RPM is a normal afternoon operating characteristic

B. Stop operations and report the change in swing control feel as a deficiency — a change in control response that develops during the shift without cause indicates a developing hydraulic or mechanical problem requiring investigation

C. Continue operations and document the observation in the post-shift log for maintenance review at the next service interval

D. Reduce all picks to 70% of rated capacity — lighter loads reduce the swing torque requirement and restore normal control feel

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26. Under OSHA 1926 Subpart CC, what is the requirement for two-way communication between the operator and signal person during crane operations?

A. Reliable two-way communication must be maintained throughout all lifting operations — if communication is lost at any point during a lift, all crane movement must stop until communication is fully restored

B. Two-way communication is required only for blind lifts where the operator cannot see the load — for visible lifts, one-way hand signals satisfy the communication requirement

C. Communication must be established before the lift and re-confirmed at the set point — interruptions during the swing are acceptable if the last confirmed signal was a travel direction

D. Radio communication is required for all lifts over 75% of rated capacity — hand signals alone are not sufficient for critical lift operations

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27. A crane operator is conducting operations when the wind speed increases from 15 mph at the start of shift to 27 mph at 10:00 AM. The manufacturer's wind limit for the current boom configuration is 30 mph. The planned load has a large flat surface area. What must the operator consider before making the next pick?

A. Proceed — 27 mph is within the manufacturer's 30 mph limit and no additional evaluation is required

B. Suspend operations until wind drops below 20 mph — the 7 mph buffer from the limit is insufficient for safe operations with any load type

C. Consult the signal person about wind conditions at ground level before proceeding — ground-level wind speed governs the operational decision

D. Assess the actual wind force on the specific load — a large flat surface area generates significantly more wind force than a compact load at the same wind speed; the manufacturer's limit is based on generic load profiles and the actual load may exceed safe limits before the generic wind limit is reached

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28. A rigger reports that a pick was made with a sling rated for 14,000 lb in a vertical hitch but the load weighed 14,000 lb. The sling appeared undamaged after the pick. What action is required before that sling is used again?

A. No action — the sling was used within its rated capacity and showed no damage; it is available for immediate reuse

B. Re-inspect the sling under a bright light — if no damage is visible it may be returned to service without restriction

C. Inspect the sling thoroughly and confirm no damage before reuse — using a sling at exactly 100% of its vertical hitch rating provides no margin for dynamic forces, and the sling must be inspected before being returned to service for any subsequent pick

D. Retire the sling — any sling used at exactly 100% of its rated capacity must be removed from service regardless of apparent condition

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29. A crane operator receives a stop signal while hoisting a 22,000-pound load. The operator stops all motion. The signal person then walks away from the signaling position without giving any further signals. What must the operator do?

A. Hold the load at its current position indefinitely — the stop signal is the last valid signal and the operator must maintain that condition until a new signal is received

B. Maintain the load in position and do not move any crane function until the signal person returns and re-establishes communication — the operator must not move based on assumption about the signal person's intentions

C. Lower the load slowly to the ground — with no active signal person, the safest action is to land the suspended load

D. Contact the lift director by radio to request instructions before taking any action

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30. An operator is asked to move the crane under its own power to a new setup location 200 feet away with the boom elevated at transport angle. The travel path crosses a recently paved section of roadway. What must be assessed before travel begins?

A. The pavement's structural capacity must be confirmed as adequate for the crane's travel load — newly paved surfaces may not have cured to their full design strength and may not be rated for concentrated crawler or tire loads from crane travel

B. The boom must be lowered to ground transport position before crossing any paved surface regardless of travel distance

C. Travel over paved surfaces is always acceptable — pavement is designed for vehicle loads and crane travel qualifies as vehicular use

D. The operator must obtain a travel permit from the general contractor before moving the crane under power on any paved surface

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31. Under OSHA 1926 Subpart CC, which of the following CORRECTLY describes when a lift director is required?

A. A lift director is required for all lifts over 50,000 pounds regardless of the percentage of rated capacity

B. A lift director is required when operations are complex enough that a coordinator is needed, and is always specifically required for critical lifts — including lifts exceeding 75% of rated capacity, multi-crane lifts, and personnel platform operations

C. A lift director is required only for multi-crane tandem lifts — single crane operations do not require a lift director under OSHA 1926 Subpart CC

D. A lift director is required whenever the operator cannot see the signal person directly — in these cases the lift director serves as an intermediary communication relay

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32. A crane operator is told by the employer that due to scheduling pressure, the pre-shift inspection should be abbreviated to a 5-minute walkover focusing only on the hook and wire rope. What is the correct response?

A. Comply with the abbreviated inspection — employer scheduling directives take priority when no active lifts are in progress

B. Refuse to abbreviate the inspection — the pre-shift inspection is a regulatory requirement that cannot be shortened by employer direction; OSHA 1926.1412 specifies what must be checked and the operator is protected from adverse action for following this requirement

C. Complete the abbreviated inspection and document that a full inspection was not possible due to schedule constraints

D. Complete the abbreviated inspection but require the lift director to sign the inspection log accepting responsibility for any unchecked items

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33. An operator is lowering a load when the hoist control is released to neutral but the load continues to descend at the same rate. What has most likely occurred and what must the operator do?

A. The hoist brake has failed to engage — stop all crane functions immediately, use the emergency brake if available, and do not resume operations until the hoist brake is inspected and repaired

B. The lowering speed is controlled by the hydraulic motor in descent mode — continuing descent at a consistent rate after releasing the control is normal hydraulic behavior

C. The rope has jumped a sheave and the load is free-falling — immediately apply maximum emergency braking

D. The load is heavier than planned — the excess weight is overpowering the brake; reduce the load before the next pick

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34. Under OSHA 1926 Subpart CC, what is the specific requirement for the operator's physical condition before beginning crane operations each shift?

A. The operator must complete a self-certification form confirming physical fitness before each shift

B. The operator must not have consumed alcohol within 8 hours before the start of the shift

C. The operator must have completed a minimum 8-hour rest period between shifts before operating covered equipment

D. The operator must not be impaired by alcohol, drugs, or any physical or mental condition that affects safe operation — OSHA 1926.1417 requires that operators be fit for duty; an impaired operator must not operate covered equipment regardless of shift schedule or employer pressure

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35. A crane's ATB device activates and stops the hoist with the block 8 feet below the boom tip. The operator resets the device and begins hoisting again. The ATB activates a second time at the same position. What does this pattern indicate?

A. The ATB trigger height is set incorrectly and needs recalibration — two activations at the same position confirm a calibration error rather than an actual two-blocking concern

B. The boom angle is too low for the current parts of line — the block cannot travel higher without two-blocking in this configuration

C. The ATB device is malfunctioning — repeated activation at the same position without load change indicates a faulty sensor requiring replacement

D. The operator is attempting to hoist beyond the available hook travel for this configuration — repeated ATB activation must never be reset and ignored; the root cause must be identified and corrected before further hoisting

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36. An operator is making a pick when a co-worker not involved in the lift walks to within 10 feet of the load and begins watching. The co-worker is outside the formally designated exclusion zone. The signal person has not given a stop signal. What must the operator do?

A. Continue the lift — the co-worker is outside the designated exclusion zone and has chosen to observe from a permitted area

B. Stop all crane movement — any person who could be struck by the load or rigging in the event of a drop or swing is within the potential drop zone; the operator must stop until all non-essential personnel are confirmed clear of the hazard area

C. Sound the horn to alert the co-worker and continue at reduced speed

D. Request the lift director address the co-worker's position while continuing the lift

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37. A crane operator is asked to perform a pick where the rigging crew has not yet completed rigging the load. The lift director says to begin taking up slack in the load line to save time while rigging is finalized. What must the operator do?

A. Refuse — taking up slack in the load line while riggers are still working on the load is prohibited; no crane function that puts tension on the rigging may begin until all personnel are clear and the signal person confirms the load is ready for pick

B. Comply at minimum hoist speed — slow line take-up gives riggers time to clear before meaningful tension develops

C. Take up slack until the slings show tension, then hold and wait for the all-clear signal before continuing

D. Comply — taking up slack is not a regulated crane function and does not require the same clearance confirmation as an actual hoist

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38. A crane performing a tandem lift with a second crane loses radio contact with the lift director at the moment the load is breaking ground. What must both crane operators do?

A. Each operator follows their last confirmed signal and completes the lift independently — tandem lift training prepares operators for loss-of-coordination scenarios

B. The lead crane operator assumes lift director responsibility and directs the second crane by hand signal until radio contact is restored

C. Both operators slow to minimum speed and proceed cautiously until radio contact is restored

D. Both operators stop all crane movement simultaneously — a tandem lift cannot safely proceed without coordinated direction from the lift director; all movement stops until communication is fully restored and the lift director reassumes control

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39. Under OSHA 1926 Subpart CC, what must an employer do when a crane operator reports that a crane has a safety deficiency?

A. Assign a second qualified operator to independently evaluate the deficiency before deciding on a course of action

B. Submit a written deficiency report to OSHA within 24 hours and continue operations while awaiting OSHA's response

C. Ensure the deficiency is evaluated by a competent person before the crane returns to service — the employer must not operate the crane with an unresolved reported deficiency and must not retaliate against the operator for the report

D. Document the operator's report and schedule the deficiency for repair at the next planned maintenance interval

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40. A crane operator is asked to hoist personnel in a man basket. The crane's load chart shows adequate capacity. The operator's NCCCO certification does not include a personnel hoisting endorsement. Is this operation permitted?

A. Yes — NCCCO certification of any type qualifies the operator for personnel hoisting when the load chart confirms adequate capacity

B. Yes — the lift director may authorize personnel hoisting by any certified operator when the load is within the crane's rated capacity

C. Yes — the load chart governs all crane operations including personnel hoisting; certification type is a secondary consideration

D. No — personnel hoisting requires compliance with OSHA 1926.1431 which includes specific crane and operator requirements beyond standard material hoisting certification; the absence of specific personnel hoisting qualification is a disqualifying condition

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41. A crane operator finishes a pick and the signal person gives the travel signal directing the crane to reposition 15 feet to the right. The load is still attached to the hook. What must the operator confirm before traveling?

A. That the travel path is clear, the load is secured against swinging, and the manufacturer's requirements for traveling with a suspended load are met — travel with a suspended load is only permitted under specific manufacturer-defined conditions

B. That the lift director has authorized the travel move by radio before any crane movement with a suspended load begins

C. That the ground along the travel path has been inspected and confirmed adequate for crane travel loads within the last 24 hours

D. That all outriggers are retracted to the travel position before any crane movement with a suspended load is initiated

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DOMAIN 3: TECHNICAL KNOWLEDGE

Questions 42–66

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42. Under ASME B30.5, which of the following conditions requires wire rope to be removed from service regardless of the broken wire count?

A. Any rope that has been in service longer than the manufacturer's recommended service life interval

B. Any rope that has been used for personnel hoisting at any point during its service life

C. Any rope showing evidence of heat exposure — discoloration, loss of lubrication, or wire deformation

D. Any rope with a broken wire at an end attachment — one broken wire at a socket, wedge, or drum anchor is an immediate removal condition regardless of total broken wire count elsewhere in the rope

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43. A rigger is preparing a four-leg wire rope bridle for a symmetric load. Two legs measure 8 feet and two legs measure 6 feet due to a last-minute substitution. All four attachment points are at equal elevation. What will happen when this load is picked?

A. The load will hang level — four-leg bridles self-equalize load distribution regardless of leg length differences

B. The longer legs will carry more load because they are at a shallower angle from horizontal and therefore more efficient

C. The shorter legs will carry a disproportionate share of the load and the load will tilt toward the short-leg side — the rigging must be corrected before the pick proceeds

D. The load will spin slowly until the leg tensions equalize through rotation — this is normal behavior for mixed-length bridles

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44. Under ASME B30.26, which of the following CORRECTLY describes the requirement for shackle pin security in overhead lifting applications?

A. All shackle pins must be secured with a secondary wire mouse regardless of pin type to prevent any rotation under load

B. Screw-pin shackles must have the pin turned fully home and may require mousing when the load application could cause the pin to rotate and unscrew — bolt-type shackles with a nut and cotter pin are self-securing and do not require additional mousing

C. Both screw-pin and bolt-type shackles must be moused with safety wire before any overhead lift regardless of load angle or duration

D. Shackle pin security is governed by the rigger's judgment — no specific standard exists for when mousing is required

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45. A crane hook is found during inspection to have a 9% increase in throat opening from its original specification. ASME B30.10 specifies mandatory removal at 15%. What is the required action?

A. A qualified person must evaluate the hook for fitness for continued service — any permanent deformation of the hook throat indicates the hook has yielded and requires evaluation regardless of whether the mandatory removal threshold has been reached

B. The hook may continue in service — the 9% measurement is below the 15% mandatory removal threshold

C. Reduce all loads to 85% of rated hook capacity to proportionally compensate for the 9% throat deformation

D. Replace the hook latch only — latch replacement restores the hook's safety retention function and no further action is required

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46. A crane's wire rope is found to have a section where the rope diameter has reduced from its nominal 1-inch diameter to 0.91 inches over a 2-foot length. What does this finding indicate and what action is required?

A. A 9% diameter reduction is within normal wear tolerance — rope diameter reductions up to 12% are acceptable under ASME B30.5

B. A 3% diameter reduction requires enhanced monitoring — a quarterly re-measurement is sufficient unless further reduction is detected

C. A 9% diameter reduction from nominal exceeds the ASME B30.5 removal criterion of 6% — the rope must be removed from service immediately regardless of the broken wire count in the reduced section

D. The reduced section must be cut out and the rope re-terminated — removal of the damaged section restores the rope to service without full replacement

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47. Under OSHA 1926.1427, which of the following is a recognized pathway for operator qualification on a construction project?

A. Completion of a manufacturer's crane familiarization course of at least 16 hours qualifies the operator for that specific crane model

B. Certification by an accredited testing organization, completion of an audited employer program, or completion of an apprenticeship program that meets OSHA requirements — all three are recognized qualification pathways under OSHA 1926.1427

C. A minimum of 2,000 hours of documented crane operating experience qualifies the operator without additional testing

D. Qualification by any certified crane operator who cosigns the trainee's time log for 500 hours of supervised operation

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48. A below-the-hook lifting beam is found in the rigging yard with a legible capacity marking but no accompanying documentation of its design basis, testing history, or manufacturing source. Under ASME B30.20, may this beam be used?

A. The beam may be used for loads below 50% of its marked capacity — reduced loading compensates for the absence of documentation

B. No — the marked capacity cannot be verified without traceable documentation of the beam's design, testing, and manufacturing basis; ASME B30.20 requires this documentation and without it the marked capacity has no confirmed basis

C. The beam may be used if a qualified rigger performs a visual inspection and confirms the beam appears structurally sound

D. The beam may be used for a single non-critical pick while replacement documentation is obtained from the manufacturer

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49. A crane operator holds current NCCCO certification for Telescopic Boom Swing Cab (TLL) cranes. The operator is asked to operate a Lattice Boom Truck (LBT) crane for one week while the regular operator is on leave. What is required before the operator may legally operate the LBT?

A. The site safety officer may authorize a one-week provisional operation period for operators holding any NCCCO certification

B. The employer may authorize the operation based on the operator's verified experience with boom cranes generally

C. The lift director may grant a site-specific operating authorization for up to 30 days for operators with equivalent crane experience

D. The operator must hold a separate LBT certification or qualification — TLL certification does not extend to LBT operations under OSHA 1926.1427; different crane types require separate qualification regardless of operational similarities

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50. A synthetic web sling is found during pre-use inspection to have a section of the outer cover that is stiff, discolored brown, and slightly brittle compared to the rest of the sling. What does this condition indicate?

A. The discoloration indicates UV degradation of the outer cover dye — UV discoloration is cosmetic and does not affect the load-bearing fiber capacity

B. The stiffness and brittleness indicate normal aging of the sling material — synthetic slings stiffen with age and this is expected behavior after several years of service

C. The condition indicates chemical exposure that has degraded the sling material — stiffness and brittleness in synthetic fibers indicates loss of flexibility that accompanies loss of tensile strength; the sling must be removed from service

D. The brown discoloration indicates the sling was exposed to petroleum lubricants — clean the sling and re-inspect before returning it to service

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51. Under ASME B30.9, which of the following is the correct procedure when a wire rope sling is found to have a kinked section during pre-use inspection?

A. The kinked section may be straightened by hand if the kink is less than 30 degrees of deflection — minor kinks are correctable without affecting capacity

B. Remove the sling from service immediately — kinks permanently damage the internal wire geometry and cannot be straightened without leaving residual damage; a kinked sling must not be used regardless of the kink's severity or apparent straightness after manual correction

C. Reduce the sling's working load limit by 25% and use it only in basket hitch configuration where the kink can be positioned away from the load contact point

D. Submit the sling for re-certification — a certified rigging shop can assess and restore kinked slings to rated capacity through controlled straightening procedures

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52. Under OSHA 1926 Subpart CC, what is the employer's obligation regarding crane operator training records?

A. Training records must be maintained at the employer's main office and provided to OSHA within 5 business days of a written request

B. Training records must be submitted to NCCCO annually for verification against the national operator registry

C. No specific records retention requirement exists — OSHA 1926.1427 focuses on qualification outcomes rather than documentation of the training process

D. This is not something OSHA specifies in terms of a national registry — the employer must be able to demonstrate the basis for each operator's qualification upon request, which requires maintaining records of the qualification process and its results

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53. A crane's periodic inspection is due. The crane has been in continuous heavy-duty service for 11 months since the last periodic inspection. The project will be complete in 3 weeks. The employer asks the operator to defer the inspection until after project completion. What is the correct response?

A. Agree to the deferral — 3 weeks beyond the annual interval is within the acceptable grace period for project-completion circumstances

B. Agree only if the crane's daily pre-shift inspections have identified no deficiencies during the 11-month period

C. Agree if the lift director documents the deferral authorization in writing — written authorization transfers inspection liability to the project management team

D. The periodic inspection cannot be deferred — ASME B30.5 and OSHA 1926.1412 require periodic inspection at intervals not exceeding 12 months; 14 weeks of additional operation would put the crane at approximately 14 months without a periodic inspection, which is a direct compliance violation

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54. A rigger proposes to use a chain sling that has had one link repaired by welding at a local welding shop. The weld appears clean and the chain shows no other defects. Under ASME B30.9, may this chain sling be used?

A. Yes — a clean weld by a qualified welder restores the chain link to its original capacity

B. Yes — if the weld passes a visual inspection by a qualified rigger, the sling may be returned to service at 75% of its original rated capacity

C. No — chain slings that have been repaired by welding are not permitted for continued overhead lifting service under ASME B30.9; welding changes the metallurgical properties of alloy chain links in ways that cannot be reliably assessed visually; the sling must be removed from service

D. Yes — the sling may be used after a proof load test at 200% of its rated working load limit confirms the weld integrity

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55. A crane operator's NCCCO certification expires while they are on an extended medical leave. They return to work 3 weeks after the expiration date. What is their qualification status?

A. The operator's certification is valid for 90 days after expiration for operators returning from documented medical leave — a physician's return-to-work clearance reinstates the certification

B. The operator is not qualified under OSHA 1926.1427 — an expired certification is not valid regardless of the reason for the expiration; the operator must not operate covered equipment until recertification is complete

C. The operator may resume operations under a 30-day provisional period while the recertification application is processed

D. The operator's employer may authorize a 60-day return-to-work period under the employer program qualification pathway while recertification is arranged

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56. Under ASME B30.5, how long must records of a crane's periodic inspection be retained?

A. For the life of the equipment — periodic inspection records must be maintained as long as the crane remains in service

B. For 5 years from the date of each inspection regardless of the crane's continued service status

C. For 3 years or until the crane changes ownership, whichever occurs first

D. Until the next periodic inspection supersedes them — only the most recent inspection record is required to be retained

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57. A rigger selects a wire rope sling for a vertical hitch pick of 18,000 pounds. The sling's tag shows a vertical hitch rating of 18,000 pounds. The pick involves a load with sharp edges at the attachment point. What concern must be addressed before this sling is used?

A. No concern — the sling is rated exactly for the load and sharp edges are a consideration only for synthetic slings, not wire rope

B. The sling must be rated at 125% of the load weight when sharp edges are present — select a sling rated for at least 22,500 pounds

C. Sharp edges must be padded or the sling must be protected — a sharp edge concentrates the entire load on a small contact area, cutting individual wires progressively and causing failure below the sling's rated capacity; edge protection is required regardless of the sling's rating

D. Select a chain sling instead — wire rope slings are prohibited at sharp edge contact points under ASME B30.9

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58. Under OSHA 1926 Subpart CC, which of the following CORRECTLY describes the required frequency of wire rope inspection for a crane in regular daily service?

A. Wire rope must be formally inspected by a third-party inspector every 90 days for cranes in daily heavy-duty service

B. Wire rope must be inspected monthly by a competent person with results documented and retained for 12 months

C. Wire rope must be inspected before each shift or before each use — the frequent inspection requirement applies every day the crane operates and wire rope condition is one of the specific items that must be checked

D. Wire rope must be inspected weekly during the first year of service and monthly thereafter once the rope's wear characteristics are established

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59. A crane is equipped with outrigger load cells that display the actual load on each outrigger in the cab. Before a pick, one outrigger reads 40% higher than the other three, which are balanced. The crane is confirmed level. What does this reading indicate?

A. A 40% variance among outrigger readings is within normal load distribution tolerance for asymmetric load geometries

B. An unbalanced outrigger load reading on a level crane may indicate a soft outrigger pad condition — the high-reading outrigger may be on a harder surface bearing more load while an adjacent outrigger is on a softer surface; alternatively, the crane's swing may be positioned in a way that shifts the center of gravity; the cause must be investigated before picking

C. The load cell on the high-reading outrigger is malfunctioning — recalibrate that sensor and proceed

D. The high reading indicates that outrigger's cylinder is at full extension while others are partially retracted — adjust all cylinders to equal extension and re-check before proceeding

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60. Under ASME B30.10, which of the following is a mandatory removal-from-service condition for a crane hook?

A. Any hook that has been in service for more than 5 years must be removed and proof-tested before continued use regardless of apparent condition

B. Any hook that has been used in a personnel hoisting application must be replaced after each use — personnel hoisting hooks are single-use components under ASME B30.10

C. Any hook loaded at more than 90% of its rated capacity on three or more occasions must be removed and re-certified before continued service

D. Any hook showing a crack, any hook with a twist exceeding 10 degrees from the hook's original plane, or any hook with a throat opening increase of 15% or more from its original specification — these are unconditional mandatory removal conditions under ASME B30.10

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61. A crane operator is reviewing a load chart and finds that the chart contains separate columns for "on outriggers" and "on rubber." The crane is currently on full outriggers with all tires confirmed off the ground. The operator uses the "on rubber" column because it shows a more conservative value. Is this approach acceptable?

A. Yes — using the more conservative chart column is always acceptable and demonstrates an extra margin of safety

B. Yes — the on-rubber column may be used for any configuration because it was developed as the conservative baseline

C. No — the operator must use the chart section that corresponds to the crane's actual configuration; using the on-rubber values for an outrigger-equipped crane means referencing capacity data developed for a different stability condition; it may be conservative in some configurations but is not valid as a substitute for the applicable section

D. Yes — operators may use any chart column that results in a load within rated capacity regardless of the actual setup condition

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62. Under ASME B30.9, what is the required action when a synthetic web sling's identification tag is found to be missing?

A. The sling's capacity may be estimated from its width and ply count using the ASME B30.9 capacity estimation chart

B. Remove the sling from service immediately — a sling without a legible identification tag cannot have its rated capacity, construction type, or application limits confirmed; it must not be used until a replacement tag is provided by the manufacturer with supporting documentation

C. A qualified rigger may assign a conservative working load limit based on visual assessment of the sling's dimensions and condition

D. The sling may be used for non-critical picks below 2 tons while a replacement tag is obtained — light use does not require tag verification

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63. A crane's load block is found during inspection to have a cracked cheek plate — the crack runs from the sheave pin bore toward the outer edge of the plate for approximately 2 inches. What is required?

A. Remove the block from service — a crack in the cheek plate is a structural failure in a critical load-carrying component; the block must not be used until the damaged plate is replaced and the assembly is inspected and verified by a qualified person

B. Monitor the crack length at each pre-shift inspection and remove the block when the crack reaches 3 inches

C. Weld repair the crack and return the block to service after the repair has cooled and passed visual inspection

D. Reduce all picks to 75% of rated capacity — the partial crack reduces the block's structural capacity proportionally

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64. Under OSHA 1926.1431, before a personnel platform proof test is performed, what specific crane condition must be confirmed?

A. The crane operator must hold a personnel hoisting endorsement on their NCCCO certification before any proof test operations begin

B. The crane must have completed its annual periodic inspection within the last 30 days before any personnel platform proof test is conducted

C. The crane's ATB device must have been tested and confirmed functional within 24 hours before the proof test begins

D. The crane must be confirmed capable of supporting 125% of the platform's rated capacity at the planned proof test configuration — if this load exceeds the crane's rated capacity at the test radius, a different crane or configuration must be used

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65. A wire rope sling is found to have a section where the outer strands have separated from each other, creating a gap through which the fiber core is visible. What is this condition called and what action is required?

A. This condition is called "valley breaking" — it is a minor surface condition that requires monitoring but not immediate removal

B. This condition is called "rope shrinkage" — it occurs when the rope is not stored under tension and the strands relax; restoring tension during use corrects the condition

C. This condition is called "bird-caging" — it occurs when the rope is subjected to sudden unloading or reverse bending; it permanently disrupts the rope's internal geometry and the sling must be removed from service immediately

D. This condition is called "strand unlaying" — it occurs when the rope is used in a rotation-inducing application; re-lay the strands and return the sling to service at 50% of rated capacity

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66. A qualified rigger is building a rigging assembly for a critical lift. The lift plan specifies 5/8-inch Grade 80 alloy chain slings. The rigger cannot locate 5/8-inch chain in the rigging yard and substitutes 1/2-inch Grade 100 chain slings with equivalent working load limit ratings. Is this substitution acceptable?

A. Yes — Grade 100 chain has higher material strength than Grade 80 and is always an acceptable upgrade regardless of diameter difference

B. No — chain sling substitutions in a critical lift plan must be evaluated against all plan requirements including diameter, chain grade, and hook and master link compatibility; a substitution that changes the chain diameter may affect the master link, hook, and fitting geometry specified in the original plan; the lift director and engineer must review and approve any substitution before proceeding

C. Yes — working load limit equivalence is the only relevant criterion for chain sling substitution; grade and diameter are secondary specifications

D. Yes — Grade 100 chain of any diameter with an equivalent WLL is interchangeable with Grade 80 chain under ASME B30.9

DOMAIN 4: LOAD CHARTS

Questions 67–90

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67. A crane's gross capacity at 24-foot radius with an 80-foot boom on full outriggers is 58,000 pounds. The hook block weighs 1,050 pounds. Four wire rope slings weigh 185 pounds each. Six shackles weigh 28 pounds each. The payload is 55,400 pounds. What is the net capacity and can this lift proceed?

A. Total deductions: block (1,050) + slings (4 × 185 = 740) + shackles (6 × 28 = 168) = 1,958 lb; net capacity = 58,000 − 1,958 = 56,042 lb; payload of 55,400 lb is within net capacity; the lift can proceed

B. Total deductions: block (1,050) + slings (740) + shackles (168) = 1,958 lb; net capacity = 56,042 lb; however, the payload at 98.8% of net capacity requires certified weight verification before proceeding

C. Total deductions: block (1,050) + slings (740) = 1,790 lb; shackle weight is not deducted from gross capacity; net capacity = 56,210 lb; the lift can proceed

D. Total deductions: block (1,050) + slings (740) + shackles (168) = 1,958 lb; net capacity = 56,042 lb; but the lift requires a critical lift plan because it exceeds 90% of net capacity

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68. A crane's load chart shows 64,000 lb gross capacity at 20-foot radius and 48,000 lb gross at 25-foot radius for the same configuration. The planned pick radius is 22 feet. After deducting block (1,100 lb) and rigging (870 lb), which net capacity value governs this pick?

A. The operator may use the proportional interpolated value of 57,600 lb gross at 22 feet — interpolation between chart rows is standard practice for intermediate radii

B. The operator must use 48,000 lb gross — the 25-foot row governs any radius between 20 and 25 feet; after deductions, net capacity is 46,030 lb

C. The operator may use 64,000 lb gross — the 22-foot radius is closer to the 20-foot row than the 25-foot row, making the 20-foot value applicable

D. The operator must average the two values — 56,000 lb gross; after deductions, net capacity is 54,030 lb

69. A crane is picking a load at 30-foot radius. The total hook load is 41,000 lb. Net capacity at 30 feet is 43,500 lb. During the swing to the set point at 35-foot radius, the load drifts outward to 38-foot radius due to a tagline crew error. The chart at 38 feet shows 36,200 lb gross and 34,240 lb net. What must happen?

A. The brief exceedance is within the 5% operational tolerance for tandem and single crane operations — continue the lift

B. Reduce swing speed for the remainder of the lift to minimize further radius increase from load drift

C. Document the unplanned radius exceedance in the daily log and complete the set — documentation satisfies the reporting requirement

D. Stop all crane movement — the load moment exceeded rated capacity at 38-foot radius; this is a rated capacity exceedance event requiring a post-incident inspection before the crane returns to service

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70. A crane is configured with a 95-foot boom and a 25-foot fixed jib at 10-degree offset. The jib load chart shows capacity values from 60-foot to 90-foot jib tip radius. The planned jib tip pick radius is 92 feet. What does the absence of a chart value at 92 feet require?

A. Use the 90-foot row value — it is conservative for any radius between 90 and 95 feet

B. The pick cannot be made at 92-foot jib tip radius in this configuration — no rated capacity exists at this radius; the crane must be repositioned, the jib offset changed, or the boom length changed to bring the pick within the chart's rated radius range

C. Contact the manufacturer for the unlisted radius value — jib charts are abbreviated and the 92-foot value exists in the manufacturer's extended data tables

D. Apply a 10% reduction to the 90-foot chart value — unlisted radii beyond the chart maximum are rated at 90% of the nearest listed value

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71. A crane has a gross capacity of 72,000 lb at 18-foot radius. After deducting block (1,300 lb), rigging (1,650 lb), and a spreader beam (4,200 lb), what is the net payload capacity and what percentage of gross capacity does the payload represent if it weighs 63,500 lb?

A. Net capacity = 72,000 − 7,150 = 64,850 lb; payload of 63,500 lb is within net capacity; 63,500 ÷ 72,000 = 88.2% of gross capacity

B. Net capacity = 72,000 − 4,950 = 67,050 lb; the spreader beam is not a deduction; payload represents 88.2% of gross capacity

C. Net capacity = 72,000 − 7,150 = 64,850 lb; payload of 63,500 lb is within net capacity; 63,500 ÷ 64,850 = 97.9% of net capacity is the more relevant percentage

D. Net capacity = 72,000 − 7,150 = 64,850 lb; total hook load (63,500 + 7,150 = 70,650) ÷ 72,000 = 98.1% of gross — this exceeds the 75% critical lift threshold

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72. A crane's load chart contains the following note: "All capacities shown assume the hook block weight has been deducted." The hook block weighs 900 pounds. The listed gross capacity at the planned configuration is 39,500 lb. Rigging weighs 620 lb. The payload is 37,800 lb. What is the correct capacity calculation?

A. Deduct block (900) + rigging (620) from 39,500 — the chart note is advisory and standard deductions always apply; net capacity = 37,980 lb; lift proceeds

B. Deduct rigging (620) only — the chart note confirms the block is already embedded; net capacity = 38,880 lb; payload of 37,800 lb is within net capacity; the lift can proceed

C. Deduct rigging (620) + add block (900) to the payload — the chart note reverses the standard deduction procedure; total comparison load = 38,700 lb versus 39,500 lb gross; lift proceeds

D. Deduct block (900) from the payload rather than from gross capacity — the chart note means block weight is the operator's responsibility to subtract from the load, not from gross

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73. A crane is operating with a 70-foot boom in the over-front configuration. The over-front directional chart shows 31,000 lb gross at 22-foot radius. The 360-degree chart shows 24,000 lb gross at the same radius and configuration. The operator plans a pick over the front at 28,000 lb total hook load. What governs?

A. The 360-degree chart governs all picks regardless of direction — the over-front value is used only when the pick point is within 5 degrees of the crane's longitudinal centerline

B. The 360-degree chart governs for all picks over the front on rubber-tired cranes — directional charts apply only to crawler cranes

C. The operator may choose either value — both are valid for over-front picks when the crane is on full outriggers

D. The over-front directional chart governs for a pick directly over the front — 31,000 lb gross capacity applies; the 360-degree value is a conservative baseline for unrestricted rotation; with a confirmed over-front pick the directional value is valid

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74. A crane is performing a pick at 26-foot radius. The pre-lift calculation shows 82% of rated capacity. The operator extends the boom from 75 feet to 85 feet to improve clearance over an obstruction while the load is on the ground. Before picking at the new configuration, what must the operator do?

A. No recalculation is needed — extending the boom while the load is on the ground does not affect the load's weight or the hook's position

B. Look up the gross capacity for the 85-foot boom at 26-foot radius, deduct block and rigging, and confirm the total hook load is within net capacity for the new configuration — boom length changes the chart section; the prior 82% calculation is no longer valid

C. Verify the new boom length does not exceed the maximum boom length for the crane's counterweight configuration

D. Re-confirm the operating radius only — radius is the primary variable that changes when boom length changes

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75. A crane operator confirms 76,000 lb gross capacity at 20-foot radius for a critical lift. Block weighs 1,400 lb. Rigging weighs 2,100 lb. The payload is 70,000 lb. What is the total hook load as a percentage of gross capacity?

A. Total hook load = 70,000 + 1,400 + 2,100 = 73,500 lb; 73,500 ÷ 76,000 = 96.7% of gross capacity; this exceeds the 75% critical lift threshold

B. Total hook load = 70,000 + 1,400 + 2,100 = 73,500 lb; 73,500 ÷ 74,500 (net) = 98.7% of net capacity; the gross percentage is not the relevant calculation for critical lift threshold

C. Total hook load = 70,000 lb payload only; rigging and block are not included in the critical lift threshold calculation; 70,000 ÷ 76,000 = 92.1%

D. Total hook load = 73,500 lb; net capacity = 72,500 lb; the lift cannot proceed because total hook load exceeds net capacity

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76. A crane's load chart shows the 60-foot boom provides 52,000 lb gross at 18-foot radius. The 75-foot boom shows 44,000 lb at the same radius. The crane is rigged with the 75-foot boom. The operator notes the 60-foot value and plans using it because it gives more capacity. Why is this approach incorrect?

A. The 60-foot boom chart provides a more conservative value at this radius — using the lower value is always acceptable practice

B. It is not incorrect — the operator may choose any boom length chart section as long as the pick is within that section's rated capacity

C. The operator must use the chart section for the actual installed boom length — the 75-foot boom changes the crane's structural loading, center of gravity, and stability geometry; the 60-foot chart does not reflect these characteristics and cannot be used for a 75-foot boom configuration

D. The 60-foot boom chart is only invalid if the crane is on rubber — on full outriggers, either boom length chart section may be used

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77. A crane performing a tandem lift has Crane A carrying 40% and Crane B carrying 60% of the total load. The total load including all rigging is 114,000 lb. Crane A's net capacity at its radius is 48,000 lb. Crane B's net capacity is 69,500 lb. During the lift, the load rotates 10 degrees, increasing Crane A's share by 6,000 lb. What is Crane A's new load and can the lift continue?

A. Crane A's new share = 45,600 + 6,000 = 51,600 lb; this exceeds Crane A's net capacity of 48,000 lb by 3,600 lb; all crane movement must stop and the load must be set to a safe surface before the lift is replanned

B. Crane A's new share = 51,600 lb; the 3,600 lb exceedance is within the 10% operational tolerance for dynamic tandem lift conditions; continue and monitor

C. Crane A's new share = 51,600 lb; reduce Crane A's boom angle to access a higher capacity chart value before continuing

D. Crane A's new share = 51,600 lb; direct Crane B to swing toward Crane A to redistribute load without stopping the lift

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78. A crane's load chart shows a maximum rated radius of 55 feet for the current configuration. The planned pick is at 52-foot radius and the set is at 55-foot radius. During the set, a tagline crew loses control and the load drifts to 57-foot radius before being arrested. What is the consequence?

A. The 2-foot drift beyond the chart maximum is within the operational tolerance for load placement at maximum radius

B. The crane operated beyond its maximum rated radius — this is a rated capacity exceedance event; the crane must stop, the load must be landed safely, and a post-incident inspection must be completed before the crane returns to service

C. Document the uncontrolled drift and continue operations — tagline crew errors are the rigging contractor's liability, not the crane operator's

D. Reduce all subsequent picks to 90% of rated capacity for the remainder of the shift to compensate for the brief structural overstress

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79. A crane picks a load at 28-foot radius. Net capacity at this configuration is 37,800 lb. Total hook load is 35,600 lb — 94.2% of net capacity. Three minutes into the swing, the operator feels the crane shift slightly toward the load and the LMI briefly reads 103%. What must the operator do?

A. Stop all crane movement immediately, hold position, land the load at the nearest safe surface, and do not resume operations until a post-incident inspection is completed — a 103% LMI reading combined with physical crane movement confirms the load moment exceeded rated capacity

B. Continue the swing at reduced speed — the 103% reading was brief and the physical shift may have been caused by wind rather than an actual overload

C. Increase boom angle to reduce the operating radius and bring the load moment within rated capacity while continuing the swing

D. Note the event in the daily log and set the load — brief LMI spikes during dynamic operations are within normal operational parameters

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80. A crane's load chart includes a note: "Capacities assume reeving of 6 parts of line." The operator is currently reeved at 4 parts of line for a series of light picks. The planned next pick requires 38,000 lb net capacity. The 4-part reeving capacity at the planned configuration is confirmed at 41,000 lb gross. Can the pick proceed using the 4-part chart values?

A. Yes — the 4-part reeving provides adequate gross capacity; the chart note applies only to the 6-part values listed and does not restrict use of other reeving configurations

B. Yes — reeving configuration does not affect rated capacity; the chart note is informational only

C. Yes — if the manufacturer's chart includes confirmed values for 4-part reeving at this configuration, and the total hook load is within those 4-part net capacity values, the pick may proceed using the 4-part chart section

D. No — the chart note means all picks in this configuration must use 6 parts of line; 4-part reeving is not permitted regardless of the load weight

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81. A crane is configured on full outriggers. The load chart shows two capacity values at 25-foot radius for the same boom length: a structural limit of 81,000 lb and a stability limit of 94,000 lb. The planned total hook load is 78,500 lb. Which value governs and can the lift proceed?

A. The stability limit of 94,000 lb governs — stability is always the primary governing factor at any radius

B. Either value governs — the operator may use whichever limit results in the most favorable capacity for the planned pick

C. The structural limit governs at radii below 30 feet — the stability limit governs above 30 feet; at 25 feet the structural limit of 81,000 lb applies

D. The structural limit of 81,000 lb governs — when both limits are present, the lower value is the rated capacity; the total hook load of 78,500 lb is within the structural limit and the lift can proceed

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82. A crane is being used for a tandem lift. The lift plan specifies equal load sharing between Crane A and Crane B. The total load including rigging is 96,000 lb. Crane A's net capacity is 51,000 lb and Crane B's net capacity is 47,000 lb. Can this lift proceed with equal load sharing?

A. No — equal sharing means each crane carries 48,000 lb; Crane B's share of 48,000 lb exceeds its net capacity of 47,000 lb by 1,000 lb; the lift cannot proceed with equal sharing; the load sharing must be revised so Crane B's assigned share does not exceed its net capacity

B. Yes — equal sharing means each crane carries 48,000 lb; both shares are within their respective capacities

C. Yes — a 1,000 lb exceedance on Crane B is within the 5% tolerance for tandem lift load sharing calculations

D. No — OSHA requires that neither crane exceed 75% of its individual rated capacity in any tandem lift regardless of load sharing arrangement

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83. A crane operator plans a series of picks ranging from 22 to 32-foot radius with the same total hook load of 29,500 lb throughout. The operator confirms net capacity at 32-foot radius is 31,200 lb and plans to use this single confirmation for all picks in the series. Is this approach valid?

A. Yes — confirming capacity at the maximum planned radius is sufficient for all shorter radii in the series when the hook load remains constant, because capacity increases as radius decreases; all shorter radii are automatically within capacity if the maximum radius is confirmed

B. Yes — but only if the operator physically measures and records the actual radius before each individual pick within the series

C. Yes — the 32-foot confirmation is valid for the full range only if the LMI is confirmed functional before the series begins

D. Yes — confirming at the maximum radius is valid only when the series spans less than 10 feet of radius variation; a 22 to 32-foot range of 10 feet requires individual confirmation at each pick

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84. A crane's load chart shows gross capacity of 45,000 lb at 30-foot radius for the 80-foot boom. The same radius for the 65-foot boom shows 49,000 lb. The crane is configured with the 80-foot boom. A pick requires 42,000 lb net capacity. Block weighs 900 lb and rigging weighs 750 lb. Can the lift proceed?

A. No — the 80-foot boom gross capacity of 45,000 lb less deductions (1,650 lb) gives net capacity of 43,350 lb, which exceeds the required 42,000 lb; the lift can actually proceed

B. No — the 65-foot boom chart showing higher capacity indicates the 80-foot boom is structurally deficient at this radius and should not be used

C. Yes — gross capacity with the 80-foot boom is 45,000 lb; deductions: block (900) + rigging (750) = 1,650 lb; net capacity = 43,350 lb; required net of 42,000 lb is within net capacity; the lift can proceed

D. Yes — but the operator should switch to the 65-foot boom to access the higher capacity and provide a greater safety margin

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85. A crane operator is planning a pick where the load will be at 18-foot radius at pick-up but will be at 26-foot radius at the set point after the swing. The operator confirms gross capacity at 18 feet and proceeds with the pick. During the swing, the load passes through a maximum radius of 28 feet before reaching 26 feet. What is the error in this planning approach?

A. No error — confirming capacity at pick and set radii is the complete planning requirement; intermediate radii during swing are operationally variable and do not require pre-confirmation

B. The operator confirmed only pick and set radii — the maximum radius reached during the swing (28 feet) must also be confirmed within rated capacity; if the chart shows lower capacity at 28 feet than the total hook load, the lift cannot be made along this swing path without replanning

C. The operator should have confirmed capacity at the set radius only — the pick radius is always within capacity if the longer-radius set point is confirmed

D. The 28-foot swing radius is within 10% of the 26-foot set radius — intermediate radii within 10% of the set radius do not require separate confirmation

86. A crane is working with 50,000 lb counterweight installed. The load chart has a section for 40,000 lb and a section for 60,000 lb counterweight. There is no chart section for 50,000 lb counterweight. What must the operator do?

A. Use the 40,000 lb counterweight section — it is always more conservative than the 60,000 lb section and provides a safe operating baseline for the intermediate counterweight

B. Contact the crane manufacturer or a qualified engineer to obtain rated capacity values for the 50,000 lb counterweight configuration before making any picks — operating with a counterweight amount not listed in the load chart means operating without a defined rated capacity

C. Use the average of the 40,000 lb and 60,000 lb chart values — interpolating between counterweight sections provides an accurate estimate for the intermediate configuration

D. Use the 60,000 lb section — heavier counterweight always provides higher capacity and using the 60,000 lb section for a 50,000 lb counterweight is conservative

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87. A crane is performing a pick at 91% of net capacity. A gust of wind causes the load to swing 5 feet laterally. The LMI spikes to 97% before the load stabilizes. After the load dampens to rest, the operator wants to continue the swing to the set point. What must happen before any further crane movement?

A. Continue immediately — the 97% LMI reading was dynamic and temporary; once the load has dampened, static load conditions apply and the prior 91% calculation governs

B. Confirm the LMI has returned to the pre-swing reading and that no structural distress sounds or visual indicators were observed during the spike before resuming movement

C. Re-measure the operating radius — wind-induced load swing can permanently shift the hook position and a new radius confirmation is required before continuing

D. Reduce the remaining hook load by 10% before continuing — a 97% LMI spike indicates the rigging is at its limit and a load reduction is required before the next move

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88. A crane's load chart note states: "Ratings shown reflect freely suspended loads. Dragging, skidding, or side-loading the crane is not permitted." A rigger proposes to drag a 25,000 lb load 4 feet horizontally before it can be freely lifted. The total hook load after the drag would be 25,900 lb and net capacity is 31,000 lb. Is the proposed operation within the crane's rated capacity?

A. Yes — the total hook load of 25,900 lb is well within the 31,000 lb net capacity; the chart note is advisory and does not prohibit the operation

B. Yes — a 4-foot drag is below the 6-foot threshold that activates the chart note restriction under ASME B30.5

C. No — the chart note specifically prohibits dragging; the rated capacity does not apply to this operation as configured; the lift must be replanned to allow a free vertical lift-off or the horizontal forces must be specifically engineered and confirmed within the crane's actual capability

D. No — any horizontal drag automatically reduces the applicable net capacity by 50% under the freely-suspended load restriction

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89. A crane has a rated gross capacity of 88,000 lb at 22-foot radius. Block weighs 1,500 lb. Rigging weighs 2,400 lb. The payload is 82,000 lb. What percentage of gross capacity does the total hook load represent and does this trigger critical lift requirements?

A. Total hook load = 85,900 lb; 85,900 ÷ 88,000 = 97.6%; this exceeds the 75% critical lift threshold; a written lift plan and pre-lift meeting are required

B. Total hook load = 82,000 lb; rigging and block are not included when calculating the critical lift threshold; 82,000 ÷ 88,000 = 93.2%; no critical lift plan is required

C. Total hook load = 85,900 lb; net capacity = 84,100 lb; the payload of 82,000 lb is within net capacity; the critical lift threshold calculation uses net capacity not gross; 82,000 ÷ 84,100 = 97.5%

D. Total hook load = 85,900 lb; 85,900 ÷ 88,000 = 97.6%; this exceeds both the 75% critical lift threshold and approaches the net capacity limit; both a critical lift plan and verified load weight are required before proceeding

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90. A crane operator completed a pre-lift check at 30-foot radius confirming adequate net capacity. The rigger repositions the load 3 feet further from the crane before signaling ready, making the actual pick radius 33 feet. The operator proceeds without re-checking the chart at 33 feet. What is the error?

A. No error — a 3-foot radius increase from 30 to 33 feet is within the 10% operational tolerance and does not require a new capacity check

B. The error is procedural only — the operator should have been notified of the repositioning before it occurred

C. The error is minor — re-checking is required only when the radius increase moves the pick into a new chart row

D. The operator used a capacity value confirmed at a shorter radius than the actual pick radius

Answer Key And Explanations

DOMAIN 1: SITE WORK

1. A — Uniform load ratings and concentrated point load capacity are structurally different. A slab rated for 250 psf uniform load can fail in punching shear at concentrated loads well below that uniform rating. A structural engineer must evaluate the slab specifically for the crane's outrigger point loads before placement.

2. C — The controlling entity's documentation does not override the operator's direct field observations. Standing water not addressed in the documentation is an unresolved condition. The operator must raise this before proceeding — written confirmation covers what was known, not what is observed in the field.

3. B — Flowing water from a burst main can saturate the soil beneath outriggers within minutes. Ground bearing capacity can drop to near zero once saturation begins. The load must be landed at the nearest safe position immediately — completing the pick cycle first risks catastrophic ground failure during the most vulnerable phase of the lift.

4. A — Loose saturated sand is susceptible to liquefaction under vibration and dynamic loading. When liquefaction occurs the sand loses virtually all shear strength instantly. The overlying gravel loses its support and the crane can overturn without progressive warning. This is not a long-term settlement concern — it is a sudden failure risk.

5. D — OSHA 1926.1409 Table A establishes 10 feet as the minimum approach distance for lines rated at 50 kV or below. This is the baseline from which all higher voltage minimums are calculated. The 5-foot figure does not appear in OSHA's crane regulation for any voltage class.

6. B — Circular surface depressions indicate subsurface void development. Voids can originate from animal activity, dissolving limestone, deteriorating buried structures, or soil piping. Any subsurface void beneath an outrigger load can collapse suddenly under crane loading. A qualified person must investigate before setup.

7. C — Tank removal excavations backfilled without engineered compaction may have lower bearing capacity and non-uniform conditions compared to undisturbed surrounding soil. Fifteen years is insufficient to guarantee consolidation equivalent to native soil. Geotechnical evaluation is required to confirm actual bearing capacity.

8. A — A structural crack directly beneath an outrigger position may indicate compromised bearing capacity at that location. The crack must be evaluated by a qualified person before load is applied. Repositioning the pad does not resolve the unknown structural condition.

9. D — OSHA 1926.1402 requires the controlling entity to disclose underground utility locations, known or suspected subsurface conditions, and proximity of structures that may affect crane operations. The

regulation does not require soil test results, utility owner license numbers, or written ground safety certifications.

10. B — Outrigger loads near an unshored excavation edge increase shear stress in the slope. If this added stress exceeds the soil's shear strength, wall collapse occurs. OSHA specifies no universal minimum setback distance — the required setback is a function of soil type, excavation geometry, and outrigger loads and must be evaluated by a qualified person.

11. A — Load chart values are valid only when the crane is within the manufacturer's levelness tolerance. At 0.8 degrees with a 0.5-degree tolerance, the chart values being used are no longer valid. The load must be landed and the crane re-leveled before any further picks.

12. C — Timber mats distribute the surface contact pressure but do not change the total load the gas main must support. A structural engineer or the utility owner must confirm the pipe's structural capacity under the anticipated outrigger loads before any crane is positioned over a high-pressure gas main.

13. B — "Previously used for light industrial storage" is a site history description, not a soil investigation. It does not identify buried foundations, compacted fill, debris, or subsurface irregularities that may be present. This description does not constitute verified ground condition information under OSHA 1926.1402.

14. D — Heavy rain infiltrating soil near a slope toe softens the material supporting the rear outriggers. Combined with the added surcharge pressure from the slope mass above, the effective bearing capacity at the rear outrigger positions may be significantly lower post-rain than conditions suggested before the rain event.

15. A — An unmarked buried utility is an unknown hazard. Setup must stop immediately. The area must be protected and the controlling entity notified. The utility must be identified and its status confirmed before any crane setup resumes in the affected area.

16. C — Frozen ground can lose bearing capacity rapidly as it thaws. Capacity confirmed in freezing morning conditions may be substantially reduced by midday in above-freezing temperatures. The outrigger conditions must be re-evaluated as temperatures rise — frozen ground capacity does not carry forward through a thaw cycle.

17. B — Reclaimed marsh fill placed over organic soils commonly contains peat and soft clay layers that have very low bearing capacity and high compressibility. These conditions can persist for decades after filling. A geotechnical investigation is essential before crane setup on any formerly marsh site regardless of surface stability.

18. C — The counterweight swings in the opposite direction from the boom and load. With an 18-foot counterweight swing radius and the outrigger 15 feet from the right-of-way boundary, the counterweight will enter the railroad right-of-way during operation. The railroad must be contacted and operational restrictions established before any crane movement begins.

DOMAIN 2: OPERATIONS

19. A — Four broken wires concentrated in a single lay length represents severe localized deterioration even though the numerical threshold of six has not been reached. ASME B30.5's apparent damage criterion requires removal when the rope's condition indicates unsafe service. The concentration of breaks — not just their count — is the governing concern.

20. C — Slow rotation under load with standard rope may indicate developing core failure or torque imbalance. The correct initial response is to stop hoisting, hold the load stable, and assess whether the rotation is progressive. Landing and switching to rotation-resistant rope is premature before the cause is assessed.

21. B — OSHA 1926.1417 requires all five conditions before the operator may leave the cab: loads fully landed, rigging released, controls neutralized, brakes applied, and locking devices engaged. Lift director presence, boom angle, and post-shift inspection are not among the specific regulatory conditions.

22. D — Uneven spooling causes rope to cross and ride over previous wraps. Each crossover crushes the inner layer of rope, permanently damaging the wires at the contact point. This is not a cosmetic issue — it progressively weakens the rope and must be investigated before further picks.

23. A — The operator's direct observation of a rigger's hand inside the hook throat is an imminent life-safety emergency. The operator must stop immediately without waiting for a signal person's stop signal. OSHA 1926.1418 establishes that the operator's direct observation of danger is an independent and sufficient basis for stopping all crane functions.

24. C — An 18-point gap between projected and actual LMI reading at lift-off is not instrument tolerance — it indicates the actual hook load is significantly greater than the 28,000 lb estimate. The load must be returned to the ground and the actual weight, radius, and rigging confirmed before any further attempt.

25. B — A change in swing control feel that develops during the shift without any change in operating conditions indicates a developing hydraulic or mechanical problem. This is not a normal afternoon operating characteristic. Operations must stop and the deficiency must be investigated before continuing.

26. A — Reliable two-way communication must be maintained throughout all lifting operations under OSHA 1926 Subpart CC. Loss of communication at any point during a lift requires all crane movement to stop until communication is fully restored. There is no exception based on lift visibility or load percentage.

27. D — The manufacturer's wind limit is based on generic load profiles. A large flat surface area generates significantly more wind force at 27 mph than a compact load of the same weight. The actual wind force on the specific load must be assessed before the pick proceeds — the generic limit does not account for load geometry.

28. C — Using a sling at exactly 100% of its vertical hitch rating provides zero margin for dynamic forces during pick-up. The sling must be inspected before reuse. Answer D overstates the requirement — ASME B30.9 does not mandate retirement of slings used at exactly rated capacity when no damage is found.

29. B — The last valid signal was stop. The operator must maintain that condition until the signal person returns and communication is re-established. Moving based on assumptions about the signal person's intentions — including lowering the load — is acting without a valid signal.

30. A — Newly paved surfaces may not have cured to full design strength. Pavement is designed for distributed vehicular wheel loads — not concentrated crawler or outrigger loads from crane travel. The surface's structural capacity for the specific crane travel load must be confirmed before crossing.

31. C — A lift director is specifically required for critical lifts under OSHA 1926 Subpart CC, including lifts exceeding 75% of rated capacity, multi-crane lifts, and personnel platform operations. OSHA does not require a lift director for all crane operations or only for multi-crane lifts.

32. B — The pre-shift inspection scope is established by OSHA 1926.1412 and cannot be shortened by employer direction. The operator is explicitly protected from adverse employment action for following the regulatory inspection requirement. An abbreviated inspection directed by the employer is not compliant.

33. A — A hoist control released to neutral that does not stop the descent indicates the hoist brake has failed to engage. This is an emergency condition. All crane functions must stop, the emergency brake applied if available, and the crane taken out of service until the hoist brake is inspected and repaired.

34. D — OSHA 1926.1417 requires operators to be fit for duty. Any physical or mental condition — including alcohol, drugs, fatigue, or illness — that affects safe operation disqualifies the operator from operating covered equipment. No specific rest period or blood alcohol threshold is stated — the standard is fitness for safe operation.

35. C — Two ATB activations at the same position without load change indicate the operator is attempting to hoist beyond the available hook travel for this configuration. Repeated ATB activation must never be reset and ignored. The root cause — too many parts of line, insufficient boom angle, or incorrect configuration — must be identified and corrected.

36. B — Any person within the potential drop zone — the area where the load could land in the event of a drop or swing — must be cleared before the lift continues. The formal exclusion zone boundary does not limit the operator's obligation to protect personnel from the actual hazard area.

37. A — No crane function that puts tension on the rigging may begin while personnel are still working on the load. Taking up slack applies tension to the rigging. The operator must refuse until all personnel are confirmed clear and the signal person gives the ready signal.

38. D — Tandem lifts require coordinated direction from the lift director at all times. Without communication, neither operator knows what the other is doing. Both operators must stop all crane movement simultaneously and hold until communication is fully restored and the lift director reassumes control.

39. C — The employer must ensure reported deficiencies are evaluated by a competent person before the crane returns to service. The crane must not operate with an unresolved reported deficiency. The employer must not retaliate against the operator for the report under OSHA 1926.1418.

40. B — Personnel hoisting requires compliance with OSHA 1926.1431 which includes specific requirements for the crane, the operator, the platform, and the lift plan that go beyond standard material hoisting. The absence of specific personnel hoisting qualification is a disqualifying condition regardless of load chart capacity.

41. A — Travel with a suspended load is only permitted under specific manufacturer-defined conditions covering travel path, load weight, travel speed, boom configuration, and surface conditions. These conditions must all be confirmed before travel begins. Lift director radio authorization and outrigger retraction are not the correct governing requirements.

DOMAIN 3: TECHNICAL KNOWLEDGE

42. D — One broken wire at an end attachment — socket, wedge, or drum anchor — is an immediate removal condition under ASME B30.5 regardless of the total broken wire count elsewhere in the rope. End attachment areas are high-stress zones where a single broken wire indicates advanced deterioration at the most critical location.

43. C — In a four-leg bridle with unequal leg lengths, shorter legs resist elongation more and carry a disproportionate share of the load. The load tilts toward the short-leg side. Two legs at 6 feet and two at 8 feet create unequal load distribution and a tilted load — the rigging must be corrected before the pick.

44. B — Screw-pin shackles can rotate and unscrew under loads that cause the pin to spin — particularly at angular or dynamic loading. Bolt-type shackles with a nut and cotter pin are self-securing. Mousing is required for screw-pin shackles in applications where rotation is possible, but bolt-type shackles do not require additional mousing.

45. A — The mandatory removal threshold of 15% is not the only trigger for hook removal. Any permanent deformation of the hook throat indicates the hook has yielded under load. A qualified person must evaluate the hook for fitness for continued service — the 9% measurement is below the mandatory threshold but requires professional assessment.

46. C — ASME B30.5 specifies removal from service when rope diameter is reduced 6% or more from nominal. A reduction from 1.00 inch to 0.91 inches is a 9% reduction — exceeding the threshold. The rope must be removed from service regardless of broken wire count in the affected section.

47. B — OSHA 1926.1427 recognizes three qualification pathways: certification by an accredited testing organization, completion of an audited employer program, and completion of a qualifying apprenticeship program. Hours of experience, co-signing, and manufacturer familiarization courses are not recognized pathways.

48. A — ASME B30.20 requires below-the-hook lifting devices to have traceable documentation of their design basis, manufacturing source, and testing history. Without this documentation, the marked capacity has no confirmed basis. The device must not be used regardless of load percentage or visual condition.

49. D — NCCCO TLL and LBT are separate certification categories. TLL certification does not extend to LBT operations. OSHA 1926.1427 requires qualification specific to the crane type being operated. No provisional period, employer authorization, or site-specific waiver substitutes for the required separate qualification.

50. C — Stiffness, brittleness, and brown discoloration in synthetic sling fibers indicate chemical exposure that has degraded the material. Chemical degradation reduces tensile strength without visible fiber breakage. The sling must be removed from service — these symptoms confirm loss of structural integrity.

51. B — Kinks permanently damage the internal wire geometry of wire rope slings. The wires at the kink point are permanently deformed and the load path through that section is compromised. A kinked sling cannot be restored by straightening — residual damage remains at the kink location. Immediate removal from service is required.

52. A — The employer must be able to demonstrate the basis for each operator's qualification upon request. This requires maintaining records of the qualification process and results. Records must be available at the job site under OSHA 1926.1427. No national registry submission requirement exists.

53. D — ASME B30.5 and OSHA 1926.1412 allow no grace period or project-completion exception for periodic inspections. The 12-month maximum interval is absolute. Operating 3 additional weeks puts the crane at approximately 14 months — a direct compliance violation regardless of daily inspection results or employer authorization.

54. C — ASME B30.9 prohibits the use of chain slings that have been repaired by welding. Welding changes the metallurgical properties of alloy chain in ways that cannot be reliably assessed visually. Proof testing does not restore the chain to its original metallurgical condition. The sling must be removed from service.

55. B — An expired NCCCO certification is not valid regardless of the reason for expiration. OSHA 1926.1427 requires the operator to hold a valid certification. No medical leave provision, provisional period, or employer authorization extends an expired certification. The operator must complete recertification before operating covered equipment.

56. A — ASME B30.5 requires periodic inspection records to be retained for the life of the equipment. These records document the crane's cumulative inspection history throughout its operational life. No time-limited retention period or supersession by subsequent inspections is recognized.

57. D — Sharp edges concentrate the full load on a small contact area, progressively cutting individual wires under sustained load. This can cause sling failure below the rated capacity. Edge protection is required at any sharp-edge contact point regardless of the sling's rating or the load weight.

58. C — Wire rope is a specific item that must be checked during the frequent inspection before each shift or before each use. OSHA 1926.1412 requires this check every day the crane operates. Monthly, quarterly, or annual-only wire rope inspection does not satisfy the frequent inspection requirement.

59. B — An unbalanced outrigger load on a level crane may indicate a soft pad condition on one side, an off-center swing position, or a sensor error. The cause must be investigated before picking. A 40% variance among balanced outrigger readings is not within normal tolerance and cannot be assumed to be a sensor error without investigation.

60. D — ASME B30.10 establishes unconditional mandatory removal conditions for hooks: any crack, any twist exceeding 10 degrees from the hook's original plane, and any throat opening increase of 15% or

more from original specification. Service life, load history, and application type are not removal triggers under B30.10.

61. C — The operator must use the chart section that corresponds to the crane's actual physical configuration. The on-rubber chart was developed for a different stability condition than full outrigger setup. Using a chart section that does not match the actual configuration — even a more conservative one — is not valid practice and may produce incorrect results in some configurations.

62. B — A sling without a legible identification tag cannot have its rated capacity, construction type, or application limits confirmed. ASME B30.9 requires removal from service when the tag is missing. No estimation methodology, visual assessment, or reduced-load exception substitutes for the required tag.

63. A — A cracked cheek plate is a structural failure in a critical load-carrying component. The cheek plate transmits the entire hook load through the block assembly. A crack running from the sheave pin bore outward concentrates stress at the bore — the highest-loaded point in the plate. The block must be removed from service immediately.

64. D — Before a personnel platform proof test, the crane must be confirmed capable of supporting 125% of the platform's rated capacity at the planned test configuration. If this load exceeds the crane's rated capacity, a different crane or configuration must be used. The proof test cannot begin until this crane capacity confirmation is complete.

65. C — Bird-caging occurs when wire rope is subjected to sudden unloading or reverse bending, causing the outer strands to spring outward and separate. This permanently disrupts the rope's internal geometry and load-sharing between strands. A bird-caged rope must be removed from service immediately.

66. B — Chain sling substitutions in a critical lift plan must be reviewed against all plan requirements. A diameter change from 5/8-inch to 1/2-inch may affect master link, hook, and fitting compatibility specified in the original plan. Working load limit equivalence alone does not satisfy all substitution requirements. The lift director and engineer must approve the change.

DOMAIN 4: LOAD CHARTS

67. A — Total deductions: block (1,050) + slings (4 × 185 = 740) + shackles (6 × 28 = 168) = 1,958 lb. Net capacity = 58,000 − 1,958 = 56,042 lb. Payload of 55,400 lb is within net capacity. Every component below the hook is deducted — shackles are not exempt from deduction.

68. C — The 25-foot row governs any radius between the 20-foot and 25-foot rows. Interpolation between chart rows is not a recognized methodology. At 22-foot actual radius, the 25-foot row value of 48,000 lb applies. Net capacity = 48,000 − 1,100 − 870 = 46,030 lb.

69. D — Operating at 38-foot radius with a 41,000 lb total hook load against a 34,240 lb net capacity is a rated capacity exceedance event. The duration and cause are irrelevant. The crane must stop, the load must be landed safely, and a post-incident inspection must be completed before the crane returns to service.

70. B — The minimum radius in a jib tip chart represents the geometric and structural limit of the configuration — not a printing abbreviation. A 92-foot jib tip radius exceeds the 90-foot chart maximum.

No rated capacity exists at 92 feet. The crane must be reconfigured, repositioned, or the jib changed to bring the pick within the chart's rated range.

71. A — Total deductions: block (1,300) + rigging (1,650) + spreader beam (4,200) = 7,150 lb. Net capacity = 72,000 − 7,150 = 64,850 lb. Payload of 63,500 lb is within net capacity. 63,500 ÷ 72,000 = 88.2% of gross capacity. The spreader beam is rigging and must be deducted.

72. B — The chart note confirms the block weight is already embedded in the published gross capacity values. No block deduction is applied. Only the 620 lb rigging deduction is required. Net capacity = 39,500 − 620 = 38,880 lb. Payload of 37,800 lb is within net capacity.

73. D — The over-front directional chart governs for a confirmed pick directly over the front. The 31,000 lb gross capacity applies. The 360-degree value is a conservative baseline for unrestricted rotation — when the swing is confirmed within the front quadrant, the directional value is valid and governs.

74. B — Extending the boom from 75 to 85 feet changes the chart section. The boom length affects structural loading, center of gravity, and stability geometry. The prior 82% calculation used the 75-foot boom section — that calculation is no longer valid. The operator must look up the 85-foot boom capacity at 26-foot radius and recalculate before picking.

75. A — Total hook load = payload (70,000) + block (1,400) + rigging (2,100) = 73,500 lb. 73,500 ÷ 76,000 = 96.7% of gross capacity. This significantly exceeds the 75% critical lift threshold. A written lift plan and pre-lift meeting are required. The critical lift threshold uses total hook load as a percentage of gross rated capacity.

76. C — The operator must use the chart section for the actual installed boom length. The 75-foot boom changes the crane's structural loading, center of gravity, and stability geometry compared to the 60-foot boom. The 60-foot chart does not reflect the 75-foot boom's characteristics and is not valid for a crane configured with the 75-foot boom.

77. D — Crane A's planned share: 114,000 × 0.40 = 45,600 lb. After the 6,000 lb shift: 45,600 + 6,000 = 51,600 lb. Crane A's net capacity is 48,000 lb. Crane A is now 3,600 lb over its rated capacity. All crane movement must stop immediately and the load must be set to a safe surface before the lift is replanned to prevent load rotation.

78. B — The crane's maximum rated radius is 55 feet. Operating at 57 feet means the crane operated without a defined rated capacity — the equivalent of an overload event. The crane must stop, the load must be landed safely, and a post-incident inspection must be completed before the crane returns to service regardless of apparent damage.

79. A — A 103% LMI reading combined with a physical sensation of the crane shifting toward the load confirms the load moment exceeded rated capacity during the swing. This is a rated capacity exceedance event. All crane movement must stop, the load must be landed at the nearest safe surface, and a post-incident inspection must be completed before any further operations.

80. C — If the manufacturer's chart includes confirmed capacity values for 4-part reeving at the planned configuration, and the total hook load is within those values, the pick may proceed using the 4-part chart

section. The chart note about 6-part reeving applies to the 6-part values listed — it does not prohibit use of other reeving configurations that have their own confirmed chart values.

81. D — When both structural and stability limits are present for the same configuration, the lower value is the rated capacity. The structural limit of 81,000 lb is lower than the stability limit of 94,000 lb — it governs. The total hook load of 78,500 lb is within the 81,000 lb structural limit and the lift can proceed.

82. B — Equal sharing: 96,000 ÷ 2 = 48,000 lb per crane. Crane A's share (48,000) is within its net capacity (51,000). Crane B's share (48,000) exceeds its net capacity (47,000) by 1,000 lb. The lift cannot proceed with equal sharing. The load distribution must be revised so Crane B carries no more than 47,000 lb — approximately 49% — before the lift proceeds.

83. A — Confirming capacity at the maximum planned radius is valid for all shorter radii when the hook load remains constant. Load chart capacity increases as operating radius decreases for the same configuration. If the load is within net capacity at 32 feet, it is automatically within net capacity at all shorter radii in the planned series.

84. C — The 80-foot boom is installed — its chart section governs. Gross capacity: 45,000 lb. Deductions: block (900) + rigging (750) = 1,650 lb. Net capacity = 43,350 lb. Required net capacity of 42,000 lb is within net capacity by 1,350 lb. The lift can proceed. The 65-foot boom's higher chart value is irrelevant — the 80-foot boom is the installed configuration.

85. D — Capacity must be confirmed at every radius the load will experience during the lift — including the maximum radius reached during the swing path, not just the pick and set radii. If the swing passes through 28-foot radius and the chart shows lower capacity than the total hook load at 28 feet, the lift cannot follow that swing path without replanning.

86. B — Operating with a counterweight amount not listed in the load chart means operating without a defined rated capacity. The operator cannot interpolate between counterweight sections or use an adjacent section as a substitute. The crane manufacturer or a qualified engineer must provide rated capacity values for the actual counterweight configuration before any picks are made.

87. D — After a dynamic LMI spike and physical crane movement confirm a transient overload condition, the operator must confirm the LMI has returned to the pre-swing reading and that no structural distress indicators were observed during the spike. A 97% spike at 91% base loading confirms the dynamic forces pushed the load moment above rated capacity — both conditions must be clear before resuming movement.

88. C — The chart note specifically prohibits dragging. The rated capacity values do not apply to operations involving horizontal drag forces. Dragging introduces friction forces that act horizontally at the hook, creating additional bending moment not accounted for in the chart. The lift must be replanned to eliminate the drag requirement or the drag forces must be specifically engineered.

89. D — Total hook load = payload (82,000) + block (1,500) + rigging (2,400) = 85,900 lb. 85,900 ÷ 88,000 = 97.6% of gross capacity. This exceeds the 75% critical lift threshold. Net capacity = 88,000 − 1,500 − 2,400 = 84,100 lb. Payload of 82,000 lb is within net capacity by 2,100 lb. Both a critical lift plan and verified load weight are required before this pick proceeds.

90. D — Any change in operating radius requires re-confirmation against the load chart. The capacity confirmed at 30 feet does not apply to a pick at 33 feet. The operator used an unconfirmed radius — a direct violation of proper load chart procedure. The capacity at 33 feet may be significantly lower than at 30 feet, potentially resulting in an exceeded rated capacity.