ASME B30.20 INTERPRETATIONS

Replies to Technical Inquiries
November 1996 – October 1997

FOREWORD

This publication includes all of the written replies issued between the indicated dates by the Secretary, speaking for the ASME B30 Committee, Safety Standards for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings, to inquiries concerning interpretations of technical aspects of ASME B30.20, Below-the-Hook Lifting Devices.

These replies are taken verbatim from the original letters except for a few typographical corrections and some minor editorial corrections made for the purpose of improved clarity. In some few instances, a review of the interpretation revealed a need for corrections of a technical nature; in these cases, a corrected interpretation follows immediately after the original reply.

These interpretations were prepared in accordance with the accredited ASME procedures. ASME procedures provide for reconsideration of these interpretations when or if additional information is available that the inquirer believes might affect the interpretation. Further, persons aggrieved by this interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

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STD.ASME B30.20-ENGL 1999 ■ 0759670 0613336 T49 ■

Interpretation: 20-10

Subject: ASME B30.20-1993

Date Issued: October 3, 1997

Question (1): Does para. 20-1.2.1, Markings, limit the manufacturer's ability to attach only one load capacity rating on a device that may have been intended and designed to support several different load capacities under different structural loading scenarios (i.e., a load beam that while being suspended from one overhead crane may only have a 20 ton capacity, while the same beam suspended from two cranes may have a capacity of 40 ton)?

Reply (1): No.

Question (2): If the answer to Question (1) is "no," is the above description of a load beam with dual capacities permissible provided it is clearly labeled as such and it meets all sections of the B30.20 volume?

Reply (2): Yes.

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ASME B30.20 INTERPRETATIONS

Replies to Technical Inquiries
April 1988 – October 1996

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Interpretation 20-9

Subject: ASME B30.20-1993

Date Issued: October 18, 1996

Question (1): Regarding Rated Load Test, para. 20-1.4.2(a) states in part:

> Prior to initial use, all new, altered, modified, or repaired lifting devices should be tested and inspected by or under the direction of a qualified person and a written report be furnished by such a person, confirming the load rating of the lifter.

If multiple units of a lifting device are to be produced from a single assembly drawing, is it adequate to test the first unit and then to validate the structural integrity of all subsequent units by similarity of construction (common drawings)?

Reply (1): No. A manufacturer producing multiple units of a lifting device, according to a single design assembly drawing, does not assure that all units will be identical and able to meet the criteria of the rated load test. Therefore, one should not conclude that a rated load test done on the first unit can validate the structural integrity of all subsequent units by similarity of construction.

Question (2): Does a qualified person necessarily have to be a licensed Professional Engineer?

Reply (2): A person does not have to be a licensed Professional Engineer to be a qualified person. The B30.20 definition of "qualified person" is "a person who, by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work."

Question (3): Is a degreed engineer with a background in structures sufficient for directing the test?

Reply (3): See Reply (2).

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ASME B30.20—Interpretations

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April 1988 — June 1993

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Interpretation: 20–8

Subject: B30.20–1985, Below–the–Hook Lifting Devices

Date Issued: June 21, 1993

Question (1): Are scrap charging buckets and vessels suspended from a running overhead crane for use in charging aluminum melting furnaces considered below–the–hook lifting devices?

Reply (1): The intention of the B30.20 volume is to address lifters that are attached below the hook and, by supporting or gripping, lift, transport, and release a load. Buckets, hoppers, crucibles, vessels, and similar containers that are loaded prior to transporting are themselves not considered a B30.20 lifting device. If these containers are supported by other than the crane hook, the intermediate supporting member may fall under B30.20 or other B30 volumes such as B30.9 Slings.

Question (2): If the answer to Question (1) is yes, would molten metal crucibles which are crane suspended also fall into this category?

Reply (2): See Reply (1).

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April 1988 — March 1993

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Interpretation: 20-3

Subject: ANSI/ASME B30.20-1985, Below-the-Hook Lifting Devices

Date Issued: February 1, 1991

Question: With regard to Section 20-1.2.2, General Construction, does the factor of 3, based on yield, apply to tension, shear, and bearing, without regard to AISC allowables?

Reply: This paragraph determines the maximum allowable stress for materials used as load-bearing structural components. Analysis or actual maximum working stresses must be determined based upon working conditions including impact or any other factors pertinent to the application. Actual maximum working stresses must be equal to or less than the allowable stress.

The intent of Section 20-1.2.2 is that the load suspension parts of a lifter shall be designed so that the static stress calculation for the rated load shall not exceed 33% of the yield strength.

This Standard is designed to guard against and minimize injury to workers, and otherwise provide for protection of life, limb, and property by prescribing safety requirements. This Standard is not a design standard and does not preclude applicable standards whose guidelines result in lower allowable stresses.

Interpretation: 20-4

Subject: ANSI/ASME B20.20-1985, Below-the-Hook Lifting Devices

Date Issued: September 24, 1991

Question: The following constitutes a request for an interpretation of the sentence under subparagraph (a) of the subject paragraph (20-1.4.2) "Test loads shall not be more than 125% of the rated load unless otherwise recommended by the manufacturer."

Given the minimum design factor of 3 (to rated load) based on yield strength for load bearing structural components (para. 20-1.2.2), the test load of 125% of rated load stresses the structural member(s) to a maximum of 42% of yield. We understand this to constitute a prohibition of testing to a percent of yield greater than 42%, based on "...shall not be more than 125%..." of para. 20-1.4.2 (unless otherwise recommended by the manufacturer).

We request a finding as to the correctness of our understanding.

Certain military regulations mandate a test load of 200% of rated load on selected below-the-hook critical lift devices designed to the same minimum factor of 3 (to rated load) based on yield strength for load bearing structural members, resulting in their being stressed to a maximum of 67% of yield. We are concerned as to whether this 67% value might be injurious to the equipment in light of the B30.20 42% limitation, thereby being counter to the "super safe" intent behind the military's 200% load test requirement. By and large, the below-the-hook lifting devices are custom designed and built steel fabrications by independent contractors to military specifications dedicated for specific lifting applications.

We request a finding as to the basis for the B30.20 limitations, the validity of our expressed concern, and the potential consequences of the continuation of the aforesaid military practice.

Reply: The maximum 125% proof test limit is the accepted industry practice for hoists, cranes, and below-the-hook lifting devices.

The maximum 125% proof test should only be exceeded when approved by the manufacturer or a qualified person.

Proof testing and periodic load testing using loads that approach or exceed 42% of the yield strength of the materials may cycle the material well above the endurance limit and eventually contribute to a fatigue failure.

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ASME *B30.20*INT ** 0759670 0551135 10T

Interpretation: 20-5

Subject: ANSI/ASME B30.20-1985 & ANSI/ASME B30.20a-1987, Below-The-Hook Lifting Devices

Date Issued: August 21, 1992

Question: (1) Does Section 20-1.4.2, "Rated Load Test," recommend a rated load test before placing equipment into service?

Reply (1): Yes. However, this does not preclude reasonable periodic retesting.

Question: (2) How do you assure the structural integrity against cracked critical welds or structural members without load testing the lifting device?

Reply (2): Inspection by a qualified person for visual signs of cracking or damage. Some form of NDT (non destructive testing) may also be necessary where there are indications of a problem.

Question: (3) What is the rationale in Section 20-1.4.2(2), for the recommended limit of 125% of the rated load for load testing?

Reply (3): See Interpretation 20-4 issued on September 24, 1991

Interpretation: 20-6

Subject: ANSI/ASME B30.20-1985, Below-The-Hook Lifting Devices

Date Issued: August 21, 1992

Question: (1) What is a "vacuum reserve system" and a "vacuum reservoir"?

Reply (1): A "vacuum reservoir" is a storage vessel or place to reserve excess vacuum. A "vacuum reserve system" consists of those parts that ensure that all available vacuum is routed to the vacuum pad(s) to maintain control of the load.

Question: (2) Does incorporation of check valve between the powered vacuum generator and the balance of the system, create a vacuum reservoir and thus satisfy the requirement of B30.20?

Reply (2): A check valve is one acceptable method of improving the holding time of the vacuum reserve in the system.

Question: (3) Does para. 20-2.2.2(e), "Vacuum Reserve System" apply only to nonporous loads?

Reply (3): Yes, the referenced paragraph, 20-2.2.2(e), applies only to nonporous loads as stated in that paragraph, "...a clean, dry, and nonporous load."

Question: (4) What is the applicability of a vacuum reserve system when handling porous loads?

Reply (4): B30.20 applies only to nonporous loads. The committee is reviewing the definition of porous material and the use of vacuum lifters handling porous materials. Any changes to the present volume would occur on an addenda to the new volume.

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Interpretation: 20-7

Subject: ASME B30.20-1985, Below-The-Hook Lifting Devices

Date Issued: March 11, 1993

Question: (1) Does Section 20-1.2.2(a) mean that if a below-the-hook lifting device has welds, it can only be constructed of steel?

Question: (2) If so, why can't aluminum be welded per a comparable standard such as ANSI/AWS D1.2, the structural welding code for aluminum, as long as the design factor is at least 3?

Reply: In response to both questions, para. 20-1.2.2(a) welding does not cover devices constructed from materials other than steel. The B30.20 Subcommittee on Below-the-Hook Lifting Devices will review for possible future inclusion lifters that are made from materials other than steel.

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