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December 4, 1972

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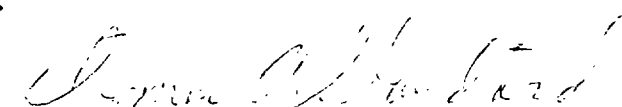
APPLICATION OF OSHA STANDARDS

Attached is a report prepared by Mr. O. J. Fisher of Babcock & Wilcox for distribution to the ABMA Product Safety Committee. This committee is working to get OSHA to accept revisions or interpretations to their regulations so they may be reasonably applied to our product.

There are areas, such as "Means of Egress" discussed on Page 2 of the report, where a strict interpretation of OSHA could conflict with good boiler design. As rulings on these areas are obtained from OSHA, they will be circulated through the company.

If there are items you would like discussed at the ABMA Product Safety Committee, or information you desire on OSHA, please let me know.

TAS:ab
Enclosure


Thomas A. Standard, Supervisor
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1/17/02
NUECES

REVIEW OF OSHA* STANDARDS
AS THEY APPLY TO
BABCOCK & WILCOX POWER GENERATION
GROUP PRODUCTS

*Occupational Safety & Health Act

O.J. Fisher
August 18, 1972

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REVIEW OF OSHA* STANDARDS AS THEY APPLY TO
BABCOCK & WILCOX POWER GENERATION GROUP PRODUCTS

Introduction

This report reviews the OSHA standards issued in the Federal Register on May 29, 1971 and on subsequent dates under:

Title 29 - Labor
Chapter 17 - Occupational Safety & Health
Administration
Department of Labor
Part 1910 - Occupational Safety & Health Standards

which we have identified as applying to B&W Power Generation Group products. Also described, whenever necessary, are the national consensus standards which are not reported in Part 1910, but are incorporated by reference in Part 1910 and apply to B&W Power Generation Group products. Moreover, we have given the status of our work to interpret, clarify, and change these standards to make them compatible with both safety and economy.

This report was prepared for use by the ABMA Product Safety Committee now being formed. We expect the committee members will use this to obtain a quicker familiarity with the OSHA standards, as they apply to products, than can be obtained by searching through all of the standards. A limitation exists as the writer is not familiar with the products sold by other ABMA member companies and, therefore, this report is, of necessity, restricted to B&W Power Generation Group products. We have not mentioned in the body of this report all of the products or product parts which may be of concern. Instead, we have discussed only the more significant products and product parts, but have tried to include all of the products and product parts in the index. The index refers to both this report and the section of Part 1910 of the OSHA standards.

When page numbers are shown, but the reference not given, these pages are to be found in the May 29, 1971 issue of the Federal Register.

*Occupational Safety and Health Act.

REVIEW OF STANDARDS

1. Subpart D, Walking - Working Surfaces

1.1 Section 1910.23, Guarding Floor and Wall Openings

1.1.1 Product Application - Platforms and Gratings

This section, which begins on Page 10472 of the May 29, 1971 issue of the Federal Register, should be referred to by those designing platforms and gratings. It states that every stairway floor opening shall be guarded by a standard railing which is described as having a vertical height of 42" from the upper surface of the top rail to the floor. All other floor openings whether temporary or permanent shall have standard railings or shall be constantly attended by someone. OSHA also concerns itself with the possibility of persons falling through wall openings. When the bottom of the opening is less than 3 ft. above the platform and there is a drop of more than 4 ft. from the bottom of the opening to the next level, the opening shall be guarded with a screen which is capable of withstanding a load of at least 200 lb. applied horizontally and the openings in the screen shall not be more than 8 in. long. More detail on this and additional index references can be found on pages 10473 and 10474.

1.1.2 Product Application - Handrailings

Handrailings are required on every flight of stairs having four or more risers. The railings for platforms shall have a vertical height of 42 in. and the stair railings shall have vertical heights of not more than 34 in. nor less than 30 in. from the upper surface of the top rail to the surface of tread. More detail on this can be found on page 10473.

1.2 Section 1910.24, Fixed Industrial Stairs

1.2.1 Product Application - Stairways

This section indicates that fixed stairs shall be installed at angles to the horizontal between

30 and 50 degrees. It gives a table on page 10475 which sets forth permissible relations between the rise and tread run of stairs. It also gives the vertical clearance above any stair tread to an overhead obstruction which is to be at least 7 ft. measured from the leading edge of the tread. Section 1910.24 is amended on page 6576 of the March 31, 1972 issue of the Federal Register. It specifies that both interior and exterior stairs around machinery, tanks and other equipment and leading to and from floors, platforms or pits are included.

1.3 Section 1910.27, Fixed Ladders

1.3.1 Product Application - Fixed Ladders

Page 10483 through 10486 give the requirements for Fixed Ladders. It should be pointed out that on page 10485 in column two where the word chimney is used that we have determined from OSHA that the word chimney and stack are synonymous. The section on ladders will be revised when a new ANSI standard is issued by the end of 1972. OSHA has interpreted the words in the Federal Register stricter than their literal meaning and, therefore, for both chimney and other structures the following three statements are made by OSHA:

- A. It is permissible to have straight runs of ladders in excess of 30 ft. without a cage if a ladder safety device is used.
- B. It is permissible to ascend to heights greater than 20 ft. if offset ladders are used, platforms are provided, and cages are installed.
- C. It is not permissible to have a straight run of more than 20 ft. without offsets, even though a cage is provided.

2. Subpart E - Means of Egress

2.1 Section 1910.36, General Requirements

2.1.1 Product Application - Platforms

This section can be found on pages 10494 and 10495. Means of Egress applies only to

buildings and structures which are designed for human occupancy. We have interpreted this to mean that boilers are not included since they are not designed for human occupancy. However, for buildings or structures which are designed for human occupancy two means of egress remote from each other must be provided if the reasonable safety of numbers of occupants may be endangered by the blocking of any single means of egress due to fire or smoke. Other details regarding means of egress can be found in this section on the pages mentioned.

2.2 Section 1910.37, Means of Egress, General

2.2.1 Product Application - Platforms

This information is given on page 10495 and 10496. It indicates among other things the minimum width of exits shall in no case be less than 28 in. The headroom in means of egress shall be no less than 7 ft. 6 in. and no projection from the ceiling shall be less than 6 ft. 8 in. from the floor.

3. Subpart G, Occupational Health and Environmental Control

3.1 Section 1910.93 Air Contaminants. (Gases, Vapors, Fumes, Dust and Mist)

3.1.1 Product Application - Thermal Insulation

Page 10506 indicates the asbestos dust limit to be 12 fibers per milliliter greater than 5 microns in length. Subsequent to the issuance of this limitation information was obtained by OSHA concerning the carcinogenic and other harmful affects from the breathing of asbestos dust. As a result of this new information, on December 7, 1971 emergency standards were issued which greatly reduced the quantity of asbestos dust permitted. This reduced it to five fibers per milliliter greater than 5 microns in length as compared with the previous 12 fibers per milliliter greater than 5 microns in length. In addition to the above limitation, many restrictions were placed upon the work practices used when workers are using asbestos materials.

OSHA has now adopted these as permanent standards for exposure to asbestos dust. This standard is set forth in the June 7, 1972 issue of the Federal Register.

There has been some incorrect talk circulating that OSHA prohibits the use of asbestos materials. This is not true, instead OSHA has placed such severe limitations on the permissible dust loading now, and probably will lower this even further in the future, that many are considering it impracticable to use asbestos insulating materials and are seeking other types. Other air contaminants are covered in this section.

3.2 Section 1910.95, Occupational Noise Exposure

3.2.1 Product Application - Fans, Pulverizers, Valves, and Burners

This section gives the permissible noise exposures which were formerly part of the Walsh-Healey Act. This is the most difficult OSHA standard of all to comply with from the product aspects. This is due to many things, not the least of which is the difficulty of knowing in the design stage the noise level which will be produced by the product. Other complications are that the noise produced is dependent upon such factors as the loading of the equipment, the general state of repair, the acoustics of the installation, and the time of exposure for employees. An employee is permitted to be exposed to 90 dba. for eight hours, but when the decibels reach 115 the exposure limit is fifteen minutes or less. To further complicate the matter, there is a strong possibility that all of these decibel limits will be lowered as a result of the new criteria package which NIOSH has submitted to OSHA.

4. Subpart H, Hazardous Materials

4.1 Section 1910.103 Hydrogen

4.1.1 Product Application - Burners and Piping

This section can be found on page 10524. The words in this Federal Register, however,

do not apply to the situation normally found as the system described terminates at the point where hydrogen at service pressure first enters the consumers distribution piping. The Federal Register goes on to state that the inplant transfer, handling, storage, and utilization of hydrogen shall be in accordance with the Compressed Gas Association, pamphlet G-5.1-1961. However, it also states in this pamphlet that its contents do not apply downstream of the point where hydrogen at service pressure first enters the consumers distribution piping. There are other words in this pamphlet (G-5.1) which have left us in doubt and we have written to OSHA (through our Washington office) to obtain clarification.

4.2 Section 1910.106 Flammable and Combustible Liquids

4.2.1 Product Application - Oil Burner, Piping Valves and Fittings

Pages 10529 through 10546 give the standards for Flammable and Combustible Liquids. Of particular interest to boiler manufacturers is page 10536 where it states that materials for piping, valves, or fittings shall be steel or nodular iron with a few exceptions which generally do not apply to boilers. This means that cast iron, brass, bronze and copper cannot be used for oil service. The words in this section of the standards were lifted directly from NFPA 30. However, all of the words from NFPA 30 were not lifted and some of these limit the scope of NFPA 30 to include only those areas not covered by other sectional committees. If we turn to NFPA 31, which concerns oil burning equipment, we find that brass and copper are permitted. However, it still proscribes against the use of cast iron. We believe that OSHA has not conveyed the true meaning of NFPA when it incorporated parts of NFPA 30 without including the limiting words of NFPA 30 and NFPA 31. It is logical and reasonable that the requirements for oil burning equipment should be less stringent than combustible and flammable liquids in general, since many of these liquids are much more flammable than oil. We are now in the process of asking OSHA for their opinion of this situation.

5. Subpart O - Machinery and Machine Guarding

5.1 Section 1910.212, General Requirements for All Machines

5.1.1 Product Application - Fans and Pulverizers

This section which begins on page 10632 states that one or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards.

It also mentions that when the periphery of fan blades is less than 7 ft. above the floor or working level the blades shall be guarded. The guard shall have openings no larger than $\frac{1}{2}$ inch.

5.2 Section 1910.219, Mechanical Power Transmission Apparatus

5.2.1 Product Application - Pulverizers and Fans

This section which begins on 10647 covers all types and shapes of powered transmission belts except for specified belts operating at 250 ft. per minute or less. This section also covers the guarding of fly wheels.

5.2.2 Product Application - Damper Controls

This paragraph is on page 10647 and concerns the guarding of cranks and connecting rods. We have interpreted that this applies to machinery in which cranks and connecting rods move rapidly and does not apply to the slow moving controls for dampers or other mechanisms on most boilers.

5.2.3 Product Application - Soot Blowers

On page 10648 there is a paragraph concerning the guarding of horizontal shafting. It states that all exposed parts of horizontal shafting 7 ft. or less from the floor or working platform, excepting runways used exclusively for oiling or running adjustments, shall be protected by a stationary casing enclosing shafting completely or by a trough enclosing the sides and top, or sides and bottom, of shafting as location requires.

6. Subpart R, Special Industries

6.1 Section 1910.261 Pulp, Paper, and Paper Board Mills

6.1.1 Product Application - Recovery Boilers

This section begins on page 10669 of the May 29, 1971 issue of the Federal Register. On page 10673 in column one it states that smelt tanks shall be provided with vent stacks and explosion doors in accordance with the above mentioned code. Many national consensus standards are incorporated by reference into this section. The code causing us the most concern at present is: "Safety Code for Ventilation and Operation of Open-Surface Tanks 29.1-1951". When this code was obtained and examined it was found that it referred to another code which has not yet been written. B&W plans to participate in the development of this code with regard to smelt tanks used with recovery boilers.

On page 10674 it states that all drives, pulleys, couplings, and shafts on equipment requiring service while operating shall have standard guards.

On this same page, column three, it states that steam and hot water pipes within 7 ft. of the floor or working platform within 15 in. measured horizontally from stairways, ramps, or fixed ladders shall be covered with an insulating material, or guarded in such a manner as to prevent contact. These are the only words in OSHA (other than page 10677, 10688 and 10695 that we have been able to find which are concerned with hot surfaces.

6.2 Section 1910.262, Textiles

6.2.1 Product Application - Steam Piping

On page 10677 it states that, "all pipes carrying steam or hot water for process or servicing machinery, when exposed to contact and located within 7 ft. of the floor or working platform shall be covered with a heat insulating material or otherwise properly guarded."

6.3 Section 1910.263, Bakery Equipment

6.3.1 Product Application - Burners

On pages 10684 through 10686 there is reference to burners used for ovens. These include gas burning systems, oil burning equipment, and solid firing equipment. B&W does not make burners used for bakery ovens and we are merely mentioning this here to alert others who perhaps do make such equipment.

6.4 Section 1910.264, Laundry Machinery and Operations

6.4.1 Product Application - Steam Piping

On page 10688 in column number three it states that all steam pipes that are within 7 ft. of the floor or working platform and with which the worker may come into contact, shall be insulated and covered with a heat resistant material or shall be otherwise properly guarded.

6.4.2 Product Application - Safety Valves

On page 10688 in column number three it states that, "Where pressure reducing valves are used, one or more relief or safety valves shall be provided on the low pressure side of the reducing valve, in case piping or equipment on the low pressure side does not meet the requirements for full initial pressure". This paragraph goes on to give other requirements for relief and safety valves.

6.5 Section 1910.265, Saw Mills

6.5.1 Product Application - Steam Piping

On page 10695 it states that all high pressure steam piping located in or adjacent to an operating pit shall be covered with heat insulating material.

7. Subpart S, Electrical

This subpart incorporates the National Electrical Code NFPA 70-1971 and is too complex and covers too many products to itemize the requirements or the products here. It should be mentioned, however, that the February 16, 1972 issue of the Federal Register lists a series of electrical code articles.

Since these are only a portion of the electrical code articles, there is another portion which is not listed in the February 16, 1972 issue of the Federal Register. This issue of the Federal Register indicates that those electrical code articles which are listed in the Federal Register apply to both existing and new installations. It also states that those electrical code articles which are not listed in the February 16, 1972 issue of the Federal Register do not apply to existing installations. Instead, those which are not listed apply only to new installations, that is those after March 15, 1972. Therefore, in effect there is a grandfather clause in OSHA with regard to a portion of the electrical code. This is one of the few places where there is a grandfather clause in OSHA.

It also states in the February 16, 1972 issue of the Federal Register that with respect to custom made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer it is acceptable and approved if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available to the OSHA inspector.

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