1.0 Purpose

The purpose of this specification is to define the NRG requirements for purchasing steel plate, bars, and shapes to be used in code-related fabrication and repairs.

2.0 Scope

This specification shall apply to all stock and non-stock material purchased to the codes and specifications listed in Section 4.0. This specification does not apply to general machining stock (i.e., bars, rounds), steel sheet, steel flats and shaft materials.

3.0 Definitions

3.1 ASME – American Society of Mechanical Engineers

3.2 ASTM - American Society for Testing and Materials

3.3 NRG – NRG Energy Inc.

3.4 ISO – International Organization for Standardization

3.5 Manufacturer – The organization making the steel plate, bars, or shapes

3.6 Supplier – The organization providing the steel plate, bars, or shapes

4.0 References

4.1 ASME Boiler & Pressure Vessel Code Section II, Part A, “Ferrous Material Specifications”

4.2 ASME Boiler & Pressure Vessel Code Section II, Part B, “Non Ferrous Material Specifications”

4.3 ASTM A6/A6M/ASME SA-6/SA-6M, “Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling”

4.4 ASTM A20/A20M/ASME SA-20/SA-20M, “Specification for General Requirements for Steel Plates for Pressure Vessels”

4.5 ASTM A480/A480M/ASME SA-480/SA-480M, “Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip”

4.6 ASTM A484/A484M/ASME SA-484/SA-484M, “Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings”

4.7 ASTM A700, “Standard Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment”

The latest edition of the above codes and specifications shall apply. In the event of conflicts between this specification and the references cited above, the Supplier shall notify NRG, who will make the final judgment and interpretation.

5.0 Responsibility

5.1 The Supplier shall be responsible for fulfilling the requirements as set forth in this specification. Exceptions to and deviations from this specification shall be clearly delineated in the Supplier’s bid for disposition by NRG.

5.2 The Supplier shall provide certified material test reports (CMTRs) for all steel plate, bars and shapes. All CMTRs shall report chemical and mechanical test data as required. CMTRs shall be in English units or if in another language with conversions to English units. A certificate of compliance will be accepted for ASTM A36 steel.

5.3 The Manufacturer shall have a Quality Program that is in compliance with and certified to ISO 9001.

5.4 In the event that the Supplier is not the Manufacturer, the Supplier must have a formal program for qualifying their manufacturers and must have evidence of periodically monitoring their performance.

5.5 NRG Supply Chain Department shall include the ordering information from the applicable ASTM/ASME specification in the purchase order. This information includes, but is not limited to:

5.5.1 ASTM/ASME specification designation
5.5.2 Form of material (plate, shape, bar, etc.)
5.5.3 Shape designation, or size and thickness or diameter
5.5.4 Grade, class and type designation (if applicable)
5.5.5 Condition (as-rolled, hot-rolled, normalized, annealed, etc.)
5.5.6 Finish
5.5.7 Quantity
5.5.8 Length or dimensions
5.5.9 Exclusions
5.5.10 Heat treatment requirements
5.5.11 Requirement that Supplier provide CMTRs
5.5.12 Supplementary requirements (when applicable)

6.0 Material

6.1 Pressure vessel plate shall be manufactured in accordance with the requirements of ASTM A20/A20M/ASME SA-20/SA-20M.

6.2 Stainless steel plate shall be manufactured in accordance with the requirements of ASTM A480/A480M/ASME SA-480/SA-480M.

6.3 Stainless steel bars and shapes shall be manufactured in accordance with the requirements of ASTM A484/A484M/ASME SA-484/SA-484M.

6.4 Structural steel shall be manufactured in accordance with the requirements of ASTM A6/A6M/ASME SA-6/SA-6M.

6.5 All materials of construction shall be new.

7.0 Inspection and Testing

7.1 Visual inspection shall be performed to assure proper surface finish and the absence of any harmful defects, scars, dents, or nicks, the presence of which shall be cause for rejection.

7.2 Heat and/or product analysis shall be performed as required by the applicable ASTM/ASME material specification. The material composition shall meet the requirements of the ASTM/ASME material specified.

7.3 Mechanical tests shall be performed as required by the applicable ASTM/ASME material specifications. The mechanical test results shall meet the requirements of the ASTM/ASME material specified.

7.4 100% ultrasonic examination shall be conducted on all pressure vessel plate over 1" in thickness.

7.5 For SA-387 materials, heat treatment shall be in accordance with the requirements of ASTM A387/ASME SA-387 with the exception that accelerated cooling is prohibited. Hardness shall not exceed 95 Rockwell B/Brinell 207.

8.0 Marking and Shipping

8.1 Material identification markings shall be in accordance with the applicable ASTM/ASME code.

8.2 Pressure vessel plate shall be die stamped with the following information in two places:

8.2.1 Applicable ASTM/ASME specification designation
8.2.2 “G” or “MT” (if heat treatment is applicable)
8.2.3 Applicable grade, type, and class
8.2.4 Heat number
8.2.5 Plate identifier
8.2.6 Name, brand, or trademark of manufacturer

8.3 Stainless steel plate shall be die-stamped, marked or stenciled with the following information:

8.3.1 Applicable ASTM/ASME specification designation
8.3.2 Type of steel
8.3.3 Material identification number
8.3.4 Name or mark of manufacturer

8.4 Pressure vessel and stainless steel plate 1/4” thick or less shall be stenciled instead of stamped.

8.5 Stainless steel bars and shapes shall be stenciled or tagged with the following information:

8.5.1 Applicable ASTM/ASME specification designation
8.5.2 Heat number
8.5.3 Grade or type
8.5.4 Condition
8.5.5 Name of manufacturer
8.5.6 Size, length, and weight (where appropriate)

8.6 Structural steel plate shall be die-stamped, marked or stenciled with the following information:

8.6.1 Applicable ASTM/ASME specification designation
8.6.2 “G” or “MT” (if heat treatment is applicable)
8.6.3 Applicable grade
8.6.4 Heat number
8.6.5 Size and thickness
8.6.6 Name, brand, or trademark of manufacturer

8.7 Structural steel shapes shall be marked with the following information on each piece:

8.7.1 Applicable ASTM/ASME specification designation
8.7.2 Grade
8.7.3 Heat number
8.7.4 Size of section
8.7.5 Length
8.7.6 Mill identification marks

8.8 Structural steel bars in secured lifts shall be tagged with the following information:

8.8.1 Applicable ASTM/ASME specification designation
8.8.2 Grade number (where appropriate)
8.8.3 Size and length
8.8.4 Heat number
8.8.5 Weight of lift

8.9 Tags must be able to withstand shipping and exposure to the elements; paper tags especially must be able to resist exposure to rain, snow, sleet and wind.

8.10 Packaging, marking, and loading for shipment shall be in accordance with ASTM A700.

9.0 Documentation

The Supplier's final documentation package shall include the following:

9.1 CMTRs
9.2 Manufacturer's ISO certificate