NB-5283 Components Exempt From Preservice Examination

The following components or parts of components are exempted from the volumetric and surface examination requirements of this subarticle:

(a) piping of NPS 1 (DN 25) and smaller;
(b) reactor vessel head connections and associated piping, NPS 2 (DN 50) and smaller, made inaccessible by control rod drive penetrations; and
(c) integral attachments of supports and restraints that are inaccessible due to being encased in concrete, buried underground, or encapsulated by guard pipe.

NB-5300 ACCEPTANCE STANDARDS

(a) Section XI, Division 1 Examinations

STANDARDS

Indications shown on the radiographs of welds and characterized as imperfections are unacceptable under the following conditions:

(a) any indication characterized as a crack or zone of incomplete fusion or penetration;

(b) any other elongated indication that has a length exceeding:

(1) \( \frac{1}{4} \) in. (6 mm) for \( t \) up to \( \frac{3}{4} \) in. (19 mm), inclusive

(2) \( \frac{2}{5} t \) for \( t \) from \( \frac{3}{4} \) in. (19 mm) to \( 2\frac{1}{4} \) in. (57 mm), inclusive

(3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over \( 2\frac{1}{4} \) in. (57 mm)

where \( t \) is the thickness of the thinner portion of the weld.

(c) internal root weld conditions are acceptable when the density change or image brightness difference as indicated in the radiograph is not abrupt; elongated indications on the radiograph at either edge of such conditions shall be unacceptable, as provided in (b) above;

(d) any group of aligned indications having an aggregate length greater than \( t \) in a length of \( 12t \), unless the minimum distance between successive indications exceeds \( 6L \), in which case the aggregate length is unlimited, \( L \) being the length of the largest indication;

(e) rounded indications in excess of that shown as acceptable in Section III Appendices, Mandatory Appendix VI.

NB-5330 ULTRASONIC ACCEPTANCE STANDARDS

NB-5331 Fabrication

All imperfections that produce a response greater than 20% of the reference level shall be investigated to the extent that the operator can determine the shape, identity, and location of all such imperfections and evaluate them in terms of the acceptance standards given in (a) and (b) below.

(a) Imperfections are unacceptable if the indications exceed the level amplitude and have lengths exceeding:

(1) \( \frac{1}{4} \) in. (6 mm) for \( t \) up to \( \frac{3}{4} \) in. (19 mm), inclusive

(2) \( \frac{2}{5} t \) for \( t \) from \( \frac{3}{4} \) in. (19 mm) to \( 2\frac{1}{4} \) in. (57 mm), inclusive

(3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over \( 2\frac{1}{4} \) in. (57 mm)

(b) Indications characterized as cracks, lack of fusion, or incomplete penetration are unacceptable regardless of length.

NB-5332 Preservice Examination

(a) Components whose volumetric examination reveals flaws that meet the acceptance standards of Section XI, Article IWB-3000 shall be acceptable. The flaws will be dimensioned and recorded in accordance with Section V, Article 4 and this Subsection.

(b) Components whose volumetric examination reveals flaws that exceed the standards of Section XI, Article IWB-3000 are not acceptable for service and shall be repaired.

NB-5340 MAGNETIC PARTICLE ACCEPTANCE STANDARDS

NB-5341 Evaluation of Indications

(a) Mechanical discontinuities at the surface are revealed by the retention of the examination medium. All indications are not necessarily defects, however, since certain metallurgical discontinuities and magnetic permeability variations may produce similar indications that are not relevant.

(b) Any indication that is believed to be nonrelevant shall be reexamined by the same or other nondestructive examination methods to verify whether or not actual defects are present. Surface conditioning may precede the reexamination. After an indication has been verified to be nonrelevant, it is not necessary to reinvestigate repetitive nonrelevant indications of the same type. Nonrelevant indications that would mask defects are unacceptable.

(c) Relevant indications are indications that result from imperfections. Linear indications are indications in which the length is more than three times the width. Rounded indications are indications that are circular or elliptical with the length equal to or less than three times the width.

NB-5342 Acceptance Standards

(a) Only imperfections producing indications with major dimensions greater than \( \frac{1}{16} \) in. (1.5 mm) are required to be evaluated for acceptance.
NB-5283 Components Exempt From Preservice Examination

The following components or parts of components are exempted from the volumetric and surface examination requirements of this subsection:

(a) piping of NPS 1 (DN 25) and smaller;
(b) reactor vessel head connections and associated piping, NPS 2 (DN 50) and smaller, made inaccessible by control rod drive penetrations; and
(c) integral attachments of supports and restraints that are inaccessible due to being encased in concrete, buried underground, or encapsulated by guard pipe.

NB-5300 ACCEPTANCE STANDARDS

NB-5320 RADIOGRAPHIC ACCEPTANCE STANDARDS

Indications shown on the radiographs of welds and characterized as imperfections are unacceptable under the following conditions:

(a) any indication characterized as a crack or zone of incomplete fusion or penetration;
(b) any other elongated indication that has a length greater than:
   (1) \( \frac{1}{4} \) in. (6 mm) for \( t \) up to \( \frac{1}{4} \) in. (19 mm), inclusive
   (2) \( \frac{1}{2} t \) for \( t \) from \( \frac{1}{4} \) in. (19 mm) to 2\( \frac{1}{4} \) in. (57 mm), inclusive
   (3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over 2\( \frac{1}{4} \) in. (57 mm)
   where \( t \) is the thickness of the thinner portion of the weld;
(c) internal root weld conditions are acceptable when the density change or image brightness difference as indicated in the radiograph is not abrupt; elongated indications on the radiograph at either edge of such conditions shall be unacceptable, as provided in (b) above;
(d) any group of aligned indications having an aggregate length greater than \( t \) in a length of 12\( t \), unless the minimum distance between successive indications exceeds 6\( L_n \), in which case the aggregate length is unlimited, \( L \) being the length of the largest indication;
(e) rounded indications in excess of that shown as acceptable in Section III Appendices, Mandatory Appendix VI.

NB-5330 ULTRASONIC ACCEPTANCE STANDARDS

NB-5331 Fabrication

All imperfections that produce a response greater than 20% of the reference level shall be investigated to the extent that the operator can determine the shape, identity, and location of all such imperfections and evaluate them in terms of the acceptance standards given in (a) and (b) below.

(a) Imperfections are unacceptable if the indications exceed the reference level amplitude and have lengths exceeding:
   (1) \( \frac{1}{4} \) in. (6 mm) for \( t \) up to \( \frac{1}{4} \) in. (19 mm), inclusive
   (2) \( \frac{1}{2} t \) for \( t \) from \( \frac{1}{4} \) in. (19 mm) to 2\( \frac{1}{4} \) in. (57 mm), inclusive
   (3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over 2\( \frac{1}{4} \) in. (57 mm)
   where \( t \) is the thickness of the weld being examined; if a weld joins two members having different thicknesses at the weld, \( t \) is the thinner of these two thicknesses.
(b) Indications characterized as cracks, lack of fusion, or incomplete penetration are unacceptable regardless of length.

NB-5332 Preservice Examination

(a) Components whose volumetric examination reveals flaws that meet the acceptance standards of Section XI, Article IWB-3000 shall be acceptable. The flaws will be dimensioned and recorded in accordance with Section V, Article 4 and this Subsection.
(b) Components whose volumetric examination reveals flaws that exceed the standards of Section XI, Article IWB-3000 are not acceptable for service and shall be repaired.

NB-5340 MAGNETIC PARTICLE ACCEPTANCE STANDARDS

NB-5341 Evaluation of Indications

(a) Mechanical discontinuities at the surface are revealed by the retention of the examination medium. All indications are not necessarily defects, however, since certain metallurgical discontinuities and magnetic permeability variations may produce similar indications that are not relevant.
(b) Any indication that is believed to be nonrelevant shall be reexamined by the same or other nondestructive examination methods to verify whether or not actual defects are present. Surface conditioning may precede the reexamination. After an indication has been verified to be nonrelevant, it is not necessary to reinvestigate repetitive nonrelevant indications of the same type. Nonrelevant indications that would mask defects are unacceptable.
(c) Relevant indications are indications that result from imperfections. Linear indications are indications in which the length is more than three times the width. Rounded indications are indications that are circular or elliptical with the length equal to or less than three times the width.

NB-5342 Acceptance Standards

(a) Only imperfections producing indications with major dimensions greater than \( \frac{1}{16} \) in. (1.5 mm) are required to be evaluated for acceptance.
NB-5283 Components Exempt From Preservice Examination or MANDE

The following components or parts of components are exempted from the volumetric and surface examination requirements of this subarticle:
(a) piping of NPS 1 (DN 25) and smaller;
(b) reactor vessel head connections and associated piping, NPS 2 (DN 50) and smaller, made inaccessible by control rod drive penetrations;
(c) integral attachments of supports and restraints that are inaccessible due to being encased in concrete, buried underground, or encapsulated by guard pipe; and
(d) exemptions from MANDE shall be in accordance with the Design Specification.

NB-5300 ACCEPTANCE STANDARDS

NB-5320 RADIOGRAPHIC ACCEPTANCE STANDARDS

Components whose volumetric examination reveals flaws that exceed the standards of Section XI, Article IWB-3000 are not acceptable for service and shall be repaired.

Incomplete fusion or penetration;
(b) any other elongated indication that has a length greater than:
(1) \( \frac{3}{4} \) in. (6 mm) for \( t \) up to \( \frac{3}{4} \) in. (19 mm), inclusive
(2) \( \frac{3}{8} t \) for \( t \) from \( \frac{3}{4} \) in. (19 mm) to \( 2\frac{1}{4} \) in. (57 mm), inclusive
(3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over \( 2\frac{1}{4} \) in. (57 mm)
where \( t \) is the thickness of the thinner portion of the weld;
(c) internal root weld conditions are acceptable when the density change or image brightness difference as indicated in the radiograph is not abrupt; elongated indications on the radiograph at either edge of such conditions shall be unacceptable, as provided in (b) above;
(d) any group of aligned indications (excluding non-relevant indications) having an aggregate length greater than \( t \) in a length of \( 12L \); unless the minimum distance between successive indications exceeds \( 6L \), in which case the aggregate length is unlimited, \( L \) being the length of the largest indication;
(e) rounded indications in excess of that shown as acceptable in Section III Appendices, Mandatory Appendix VI.

NB-5330 ULTRASONIC ACCEPTANCE STANDARDS

NB-5331 Fabrication

All imperfections that produce a response greater than 20% of the reference level shall be investigated to the extent that the operator can determine the shape, identity, and location of all such imperfections and evaluate them in terms of the acceptance standards given in (a) and (b) below.

(a) Imperfections are unacceptable if the indications exceed the reference level amplitude and have lengths exceeding:
(1) \( \frac{3}{8} \) in. (6 mm) for \( t \) up to \( \frac{3}{4} \) in. (19 mm), inclusive
(2) \( \frac{3}{8} t \) for \( t \) from \( \frac{3}{4} \) in. (19 mm) to \( 2\frac{1}{4} \) in. (57 mm), inclusive
(3) \( \frac{3}{4} \) in. (19 mm) for \( t \) over \( 2\frac{1}{4} \) in. (57 mm)
where \( t \) is the thickness of the weld being examined; if a weld joins two members having different thicknesses at the weld, \( t \) is the thinner of these two thicknesses.
(b) Indications characterized as cracks, lack of fusion, or incomplete penetration are unacceptable regardless of length.

NB-5332 Preservice Examination or MANDE

(a) Section XI, Division 1 Examinations
(1) Components whose volumetric examination reveals flaws that meet the acceptance standards of Section XI, Article IWB-3000 shall be acceptable. The flaws will be dimensioned and recorded in accordance with Section V, Article 4 and this Subsection.

(2) Components whose volumetric examination reveals flaws that meet the acceptance standards of Section XI, Article IWB-3000 shall be acceptable. The flaws will be dimensioned and recorded in accordance with Section V, Article 4 and this Subsection.

(b) Section XI, Division 2 MANDE. MANDE shall be performed in accordance with the Owner’s RIM Program as stated in the Design Specification.

NB-5340 MAGNETIC PARTICLE ACCEPTANCE STANDARDS

NB-5341 Evaluation of Indications

(a) Mechanical discontinuities at the surface are revealed by the retention of the examination medium. All indications are not necessarily defects, however, since certain metallurgical discontinuities and magnetic permeability variations may produce similar indications that are not relevant.

(b) Any indication that is believed to be nonrelevant shall be reexamined by the same or other nondestructive examination methods to verify whether or not actual defects are present. Surface conditioning may precede the reexamination. After an indication has been verified to be nonrelevant, it is not necessary to reinvestigate repetitive nonrelevant indications of the same type. Nonrelevant indications that would mask defects are unacceptable.

(c) Relevant indications are indications that result from imperfections. Linear indications are indications in which the length is more than three times the width. Rounded indications are indications that are