

**Flow Control Division**

Anchor/Darling Valves
 BW/IP Valves
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September 30th, 2019

US Nuclear Regulatory Commission
 Document Control Desk
 11545 Rockville Pike
 Rockville, MD 20852-2746

Subject: Contrary to the requirements of ASME Section III – NC-4000, Flowserve Raleigh identified the usage of base material acceptance criteria in lieu of welding acceptance criteria for valves with temporary attachments (i.e. – Lug removal areas).

This is to notify the US Nuclear Regulatory Commission that, in accordance with the provisions of 10CFR Part 21, we have identified a potential issue and are submitting our evaluation of the event.

Description:

Contrary to the requirements of ASME Section III – NC-4000, Flowserve Raleigh identified that they were utilizing as standard practice, the base material acceptance criteria in lieu of welding acceptance criteria for valves with temporary attachments (i.e. – Lug removal areas). This utilization of criteria has been ongoing as far back as Flowserve's Review could determine. No specific orders or customers are identified as this is systemic to the overall process of valve manufacturing at Flowserve Raleigh.

Evaluation:

A review was completed of the ASME Code requirements by Flowserve Raleigh's Engineering and Metallurgical Process Control Departments with the following results:

The examination of Temporary Attachment Removal Areas, to the NB/NC-2540 Examination and Repair of Forgings and Bars, and NB/NC-2570 Examination and Repair of Statically and Centrifugally Cast Products is contrary to NB/NC-5340 and 5350 acceptance criteria. However, it can be determined that Temporary Attachment Removal Areas examined to NB/NC-2500 acceptance criteria is consistent with the acceptable surface condition resulting from a welded repair performed on the same material product form. No greater risk to pressure integrity is created by the examination of Temporary Attachment Removal Areas to NB/NC-2500 acceptance criteria. The examination of Temporary Attachment Removal Areas examined to NB/NC-2500 acceptance criteria does not result in a Risk to safety relating to pressure integrity.

Paragraph NB/NC-4435 of Article NB/NC-4000 FABRICATION AND INSTALLATION contains mandatory requirements for the examination of Components. Contrary to the requirement of NB/NC-4435 (b) (3) to examine the Nonstructural Temporary Attachment Removal Area in accordance with the Acceptance Criteria of NB/NC-5340 or NB/NC-5350 Flowserve performed these examinations in accordance with Article NB/NC-2000 in accordance with the Acceptance Standards of NB/NC-2500 for the applicable Material Product Form. NB/NC-2540 Examination and Repair of Forgings and Bars, NB/NC-2570 Examination and Repair of Statically and Centrifugally Cast Products.

ND-4435 contains no mandatory requirements for the examination of Nonstructural Temporary Attachment Removal Area.

NB-4100 GENERAL REQUIREMENTS

NB-4110 INTRODUCTION

Components, parts, and appurtenances shall be fabricated and installed in accordance with the requirements of this Article and shall be manufactured from materials which meet the requirements of Article NB-2000.

ASME SECTION III NB/NC

NB-4435 Welding of Nonstructural Attachments and Their Removal

(b) Removal of nonstructural temporary attachments shall be accomplished as follows.

(3) After the temporary attachment has been removed, the marked area is examined by the liquid penetrant or magnetic particle method in accordance with the requirements of NB-5110 and meets the acceptance standards of NB-5340 or NB-5350 whichever is applicable. The NB/NC-5340/5350 Acceptance criteria is shown in the table below.

In another paragraph within Article NB-4000 the following rules are established.

NB-4131 Material originally accepted on delivery in which defects exceeding the limits of NB-2500 are known or discovered during the process of fabrication or installation is unacceptable. The material may be used provided the condition is corrected in accordance with the requirements of NB-2500 for the applicable product form. The NB-2545.3/2546.3 Acceptance criteria is shown in the table below and illustrates the increased size of acceptable indications in contrast to the NB/NC-5340/5350 acceptance criteria.

The following condition is permitted to exist in nuclear components, parts or appurtenances during NB/NC Article 4000 fabrication. A component, part or appurtenance will contain an area repair welded following the requirements of NB-4131. The material repair area will be examined per NB/NC-4131 to NB-2500 acceptance criteria. This welded repair area examined in accordance with NB-2500 may directly interface, overlap or lie adjacent to a Temporary Attachment Removal area. The examination of the Temporary Attachment Removal Area Surface will be examined to the more stringent NB-5110 acceptance criteria. The requirements of Article NB/NC-4000 permit repairs to be performed and examined in accordance to these requirements.

Components, parts and appurtenances fabricated inclusive of Material Repairs examined to the less stringent acceptance criteria constitute No RISK to the established rules of safety relating to pressure integrity, which govern the construction of nuclear components. Section III, by the establishment of the rules in NB/NC-4131 establishes that no RISK results from a welded repair surface examined in accordance with NB/NC-2540 Examination and Repair of Forgings and Bars, NB/NC-2570 Examination and Repair of Statically and Centrifugally Cast Products.

	NB-2540 EXAMINATION AND REPAIR OF FORGINGS AND BARS
NB-5340 MAGNETIC PARTICLE ACCEPTANCE STANDARDS	NB-2545 Magnetic Particle Examination
NB-5342 Acceptance Standards	NB-2545.3 Acceptance Standards.
(a) Only imperfections producing indications with major dimensions greater than 1/16 in. (1.5 mm) are required to be evaluated for acceptance.	(a) Only imperfections producing indications with major dimensions greater than 1/16 in. (1.5 mm) shall be considered relevant imperfections.
(b) Imperfections producing the following indications are unacceptable:	(b) Imperfections producing the following relevant indications are unacceptable:
(1) <u>linear indications</u> with dimensions greater than 1/16 in. (1.5 mm);	(1) any <u>linear indications</u> greater than 1/16 in. (1.5 mm) long for material less than 5/8 in. (16 mm) thick, greater than 1/8 in. (3 mm) long for material from 5/8 in. (16 mm) thick to under 2 in. (50 mm) thick, and 3/16 in. (5 mm) long for material 2 in. (50 mm) thick and greater;
(2) rounded indications with dimensions greater than 3/16 in. (5 mm);	(2) rounded indications with dimensions greater than 1/8 in. (3 mm) for thicknesses less than 5/8 in. (16 mm) and greater than 3/16 in. (5 mm) for thicknesses 5/8 in. (16 mm) and greater;
(3) four or more rounded indications in a line separated by 1/16 in. (1.5 mm) or less edge to edge;	(3) four or more relevant indications in a line separated by 1/16 in. (1.5 mm) or less edge to edge;
(4) ten or more rounded indications in any 6 in. ² (4000 mm ²) of surface with the major dimension of this area not to exceed 6 in. (150 mm) with the area taken in the most unfavorable location relative to the indications being evaluated.	(4) ten or more relevant indications in any 6 in. ² (4000 mm ²) of area whose major dimension is no more than 6 in. (150 mm) with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

	NB-2540 EXAMINATION AND REPAIR OF FORGINGS AND BARS
NB-5350 LIQUID PENETRANT ACCEPTANCE STANDARDS	NB-2546 Liquid Penetrant Examination
NB-5352 Acceptance Standards	NB-2546.3 Acceptance Standards.
(a) Only imperfections producing indications with major dimensions greater than 1/16 in. (1.5 mm) are required to be evaluated for acceptance.	(a) Only imperfections producing indications with major dimensions greater than 1/16 in. (1.5 mm) shall be considered relevant imperfections.
(b) Imperfections producing the following indications are unacceptable:	(b) Imperfections producing the following relevant indications are unacceptable:
(1) <u>linear indications</u> with dimensions greater than 1/16 in. (1.5 mm);	(1) any <u>linear indications</u> greater than 1/16 in. (1.5 mm) long for material less than 5/8 in. (16 mm) thick, greater than 1/8 in. (3 mm) long for material from 5/8 in. (16 mm) thick to under 2 in. (50 mm) thick, and 3/16 in. (5 mm) long for material 2 in. (50 mm) thick and greater;
(2) rounded indications with dimensions greater than 3/16 in. (5 mm);	(2) rounded indications with dimensions greater than 1/8 in. (3 mm) for thicknesses less than 5/8 in. (16 mm) and greater than 3/16 in. (5 mm) for thicknesses 5/8 in. (16 mm) and greater;
(3) four or more rounded indications in a line separated by 1/16 in. (1.5 mm) or less edge to edge;	(3) four or more relevant indications in a line separated by 1/16 in. (1.5 mm) or less edge to edge;
(4) ten or more rounded indications in any 6 in. ² (4000 mm ²) of surface with the major dimension of this area not to exceed 6 in. (150 mm) with the area taken in the most unfavorable location relative to the indications being evaluated.	(4) ten or more relevant indications in any 6 in. ² (4000 mm ²) of area whose major dimension is no more than 6 in. (150 mm) with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

Extent of Condition:

This utilization of criteria has been ongoing as far back as Flowserve's Review could determine. No specific orders or customers are identified as this is systemic to the overall process of valve manufacturing at Flowserve Raleigh.

Corrective Actions:

Flowserve Raleigh Corrective Action, (CAR-393758) has been issued, and is currently in process of determining root cause and preventive action measures.

Summation:

After review by Flowserve Raleigh's Engineering and Metallurgical Process Control Departments. It is the position of Flowserve Raleigh, that in accordance with the provisions of 10CFR Part 21, this condition, while reportable to the NRC (Nuclear Regulatory Commission), is not a significant/substantial safety hazard.

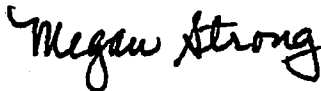
Respectfully Submitted,

Sincerely,



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