

## IWB-1220 Exemptions

**George Fechter (Southern Company):**

While the 1" and under welds could be considered to be in Category B-J, Item B9.40, my position would be not to include them in the boundary due to the 1" and under exemption. Consequently, they would not be included in the sample size or population by which ISI exam requirements are determined.

I would concur with application of the 1" and under alternative requirements for small items to the Class 1 valve which is isolated from the remainder of the Class 1 Boundary during normal operation, but to base a position on this for application at a nuclear site, I would feel it would take a Section XI issued inquiry to provide a defensible basis to the ANII and/or site NRC resident inspector, with the understanding of "use inquiries at your own risk" since they don't have to be accepted by either.

**Mark Ferlisi (Duke Energy):**

I have struggled recently with these questions and am in the process of improving the basis for our program at McGuire. Unfortunately, I cannot say that we have had a consistent, clear application of these exemptions, so I'd rather not share internal info until we can establish an appropriate position. I believe that the exemption criteria are not well written and that it can easily lead to conflicting exemptions.

This looks like an area that WG-ISC should take action on to improve the Code exemptions. In my mind, the 1" exemptions should be conditional, and dependent on whether the resulting break in the 1" line would exceed the makeup capacity. However, I don't think the words actually say that. The questions raised in your e-mail seem to support this position.

**Richard Gimple (Wolf Creek):**

I discussed this with our ISI Engineer. We feel that the requesting utility is misinterpreting IWB-1220. IWB-1220 does not say the smaller of a) or b), or some specific configuration where some see make-up and others don't, which is the way that the requestor seems to be reading it. IWB-1220 allows all of a) through d) to be exempted from IWB-2500 exams other than B-P. This is confirmed by Interpretation XI-1-86-24, which says in part:

**Question (1):** If a component is exempted from examination by one or more of IWB-1220(a), IWB-1220(b), or IWB-1220(c), may this component, and/or pressure retaining welds in this component, be exempted from the

**IWB-2200 and IWB-2500 preservice volumetric and surface examination requirements?**

**Reply (1): Yes.**

**It may help to point out that the Code is written to cover all light-water reactors, which for us in the US means either BWRs or PWRs. For PWRs, make-up capability is generally as the requestor points out, but for some generations of BWRs, it is my understanding that make-up can be provided for larger than NPS 1. Therefore, the Code did not want to limit those plants to the NPS 1 that applies to most other plants.**

**Gary Park (Ideal Solutions):**

**This is an interesting question. For us BWR guys, it is pretty simple because the makeup capacity is 1" NPS so there is no confusion. As far as the different sizes (3/8" and 1") at a PWR, I would have to say that the answer to question 1 would be yes if it was in the red area of the picture. They may not necessarily be Item B9.40 which is socket welds however. Question 2 answer would be yes. Now I refer to the PWR guys to give the correct answer.**

**I have received significant feedback on this issue and a lot of the feedback was dealing with the exemption criteria found in IWB-1220. It appears that most plants use the 1" exemption for both PWRs and BWRs alike. So if that is true for a PWR, than my answers would change. I would like to see how your survey ends up. My guess is that you will get some 50/50 split. My response would be to have whoever asked the question to submit for an official interpretation and get it resolved that way.**

**Glenn Perkins (True North Consulting):**

**Simple answer has been NO in past experience. (a) is a size exemption separate from (b). This, (a) was to allow larger lines to be exempted if makeup could be met. If memory serves me right, BWR's could exempt lines > 1" (maybe up to 3") based upon this calculation. Don't remember the details specifically.**

**Rick Swayne (Reedy Engineering):**

**I don't have any direct experience with this. And Section XI is not clear. I believe that it permits an answer of no. However, it is my understanding that most Owners would answer yes. Please note that the answer is different for a BWR.**

**Ken Thomas (Cooper):**

**Question:**

1. Do you include piping 1" and less down to the makeup size (Typically .295" ID in a PWR) in your ISI Program as B-J, B9.40?

No, these components are exempt from examination. We also have a calculation that allows us to exempt certain components larger than 1 NPS based on the make up capability (BWR).

2. Do you include these welds in your sample for examination?

No, they are exempt from examination.

**Russell Turner (TVA):**

I discussed this with Ray West. He said:

"Russell:

I think you summarized the IWB-1220 criteria pretty well. However, I don't think the make-up capability was really addressed by the Code very well for the PWRs. Keep in mind that the exemptions in IWB-1220 are only for NDE and this is kind of in line with the Bush and McCarron basis that they were concerned with personnel radiation exposure when it came to performing NDE originally. I don't know where the 1 NPS exemption really came from. If you wanted to pursue this as a possible Code change and focus on make-up capability, I would use the Small Items criteria that is in IWA-4000 as the way to address this for a Code change, but I would think you would get a lot of push back from people when you told them that for a PWR they would essentially be performing NDE for ISI on piping down to 3/8". This issue with make-up capability was recognized with RI-ISI programs, but the most that anybody did was add VT-2 exams on this small piping.

Ray"

So my answers to the questions are:

1. Do you include piping 1" and less down to the makeup size (Typically .295" ID in a PWR) in your ISI Program as B-J, B9.40? No
2. Do you include these welds in your sample for examination? No

**Ray West (TVA):**

Russell Turner discussed this with me a few days ago. He made the following observations in 1 and 2 below and I basically agree with him.

1. IWB-1220(a) is more commonly applied to BWR's, as they don't lose as much water/steam as a PWR during a LOCA, so that exemption would apply to them. I believe it is commonly a 3" opening for water systems. Not sure of steam.
2. IWB-1220(b) is typically applied to PWR's. There is no background info that I know of that gives a technical reason for the 1" size, rather it may have just seemed to be a good idea at the time (1970'ish). I have done exams on smaller piping, but it was always considered an augmented examination.

Here are my detailed thoughts on this issue. I don't think the make-up capability was really addressed by the Code very well for the PWRs, but keep in mind that the exemptions in IWB-1220 are only for NDE and this is kind of in line with the Bush and McCarray basis that they were concerned with regarding personnel radiation exposure when it came to performing NDE originally and I don't think they saw much value in performing NDE on 1 NPS and less. All this small piping was included in the visual examination during the hydrostatic test and if it is in the Class 1 boundary it still is included in the Class 1 system pressure test today. I don't know where the basis for the 1 NPS exemption really came from exactly, but it was in the original 1971 Edition of Section XI. If you look at the original Section XI, IS-121 Exclusion from System Boundary - exemption/exclusion requirements (a) allowed you to exclude things where a postulated failure could happen and the reactor could be shut down and cooled down in an orderly manner assuming makeup was provided by the reactor coolant makeup system only.

It also allowed you in (b) to exempt components where they could be isolated from the reactor coolant system with two valves (both closed, both open, or one closed and the open). Each open valve had to be capable of automatic actuation and its closure time had to be such that, for a postulated failure of the component during normal reactor operation (and the other valve is open), the reactor can be shut down and cooled down in an orderly manner assuming makeup is provided by the reactor coolant makeup system. (The makeup system was foot noted to explain that it was normal makeup, which had the capability to maintain reactor coolant inventory in all modes of operation).

Finally, in IS-121(c) it said "Component connections, piping and associated valves are not greater than one-inch nominal pipe size and such

components are included in the visual examinations performed in accordance with the requirements of IS-521.

IS-521 related to the required system hydrostatic tests.

It seems to me that if you cover the 1 NPS and less with a visual examination during a pressure test that is enough. If you wanted to pursue this as a possible Code change and focus on make-up capability, and doing NDE on 1 NPS and smaller piping I would use the Small Items criteria that is in IWA-4000 as the way to address this for a Code change in IWB-1220 for a PWR, but I would think you would get a lot of push back from people when you told them that for a PWR they would essentially be performing NDE for ISI on piping down to 3/8". This issue with make-up capability was recognized with RI-ISI programs that I have been involved with, but the most that we did was to add VT-2 exams on this small piping if they were found to be HSS at some special locations.

Based on the above background and my experience with plants that I have been associated with here are my answers:

Question:

1. Do you include piping 1" and less down to the makeup size (Typically .295" ID in a PWR) in your ISI Program as B-J, B9.40? – NO
2. Do you include these welds in your sample for examination? – NO

Ron Yonekawa (Bechtel):

Response: I believe the answers to the two questions are both yes.