Comment Set #1
"Design and Stress Analysis" & "Flaw Growth Evaluation"

- **Barrier Weld: Full Circumferential, 1/8" Thick**
  - **Postulated Flaw: 1/16" deep full circumferential planar surface flaw in the barrier weld**
  - **Postulated Flaw: 1/16" deep axial planar surface flaw in the barrier weld for its maximum axial length**
  - **Barrier Weld acceptance examination requirements make these postulated flaw assumptions extremely conservative**
- **DMW with a 1/8" thick, full circumferential barrier weld**
  - **Postulated Flaw: 3/8" deep full circumferential planar flaw in the DMW adjacent to the barrier weld fusion line**
  - **Postulated Flaw: 3/8" deep axial planar flaw in the DMW adjacent to the barrier weld fusion line for the maximum axial length of the DMW**
  - **Postulated flaw sizes in the DMW are based on the largest acceptable flaws per Table IWB-3514-2.**
  - **Postulated flaws in the DMW and barrier weld do not line up**

Comment Set #1, Cont'd
"Design and Stress Analysis" & "Flaw Growth Evaluation"

- **Demonstrate that the required barrier weld minimum thickness and examination acceptance criteria prevent flaw growth through the barrier weld for the remaining service life due to fatigue under all anticipated loadings**
- **Demonstrate that the barrier weld does not degrade the DMW**
- **Demonstrate that exposed SST cladding and SST safe end does not degrade due to high local residual tensile stress from the barrier weld**
- **Stress analysis of the final configuration shall be performed in accordance with IWA-4311**
  - **Barrier Weld Thickness: 3/8" or 10% of thickness of the DMW thickness, whichever is less**
- **Generic vs site specific analyses**

Comment Set #2
Pre-existing Flaws in the DMW

- **Pre-existing flaws in the DMW must not exceed the inservice acceptance standards of Table IWB-3514-2 prior to return to service**
  - **This applies to both circumferential and/or axial flaws**
- **Flaws on the surface to be welded must meet the acceptance criteria of Section III, NB-5352**
- **Existing flaws within the specified acceptance criteria will be isolated from the primary environment by the barrier weld**
  - **Regardless if the original flaw was ID connected or not, any remaining acceptable flaws will not be PWSCC flaws after barrier weld installation**
- **After successful installation of a barrier weld, there will be no rejectable flaws in service**
- **The requirements in this Case are such that the barrier weld remains intact for the remaining service life, preventing new PWSCC flaws**

Comment Set #3
"Sulfur Mitigation Layer"

- **Structural or Non-structural**
  - **Pressure boundary?**
- **For the purposes of this Case, the sulfur mitigation layer(s) is not part of the barrier weld**
  - **The sulfur mitigation layer(s) does not contribute to the barrier weld minimum weld layers or minimum thickness requirements**

Comment #4
Barrier Weld Design Basis

- **The barrier weld must be 360° circumferential**
- **The barrier weld longitudinal length must cover ALL of the Alloy 600 (the entire DMW and butter, if applicable) plus a conservative safety margin on both edges**
- **Flaws on the surface to be welded must meet the acceptance criteria of NB-5352. Existing flaws in the balance of the examination volume shall meet Section XI inservice examination acceptance criteria.**
- **The final surface examination shall meet the acceptance criteria of NB-5352, except rounded indications greater than 1/16" shall not be permitted. The final barrier weld ultrasonic examination shall meet the acceptance criteria of NB-5330, including HAZ if applicable. The remaining examination volume shall meet the in-service examination acceptance criteria of Tables IWB-3514-2 and IWB-3514-3.**

Comment Set #5
Barrier Weld: Cladding or Structural?

- **Cladding with structural requirements**
- **Are there different requirements if the inlay material is considered as cladding or as structural material?**
- **Is the inlay still considered mitigative if it is structural?**
- **Can cladding be considered structural in this application?**

Comment #6
Barrier Weld Minimum Thickness

> **Barrier weld minimum thickness is 1/8”**

- **Above standard NB-5352 final surface examination acceptance criteria, no rounded indications greater than 1/16”**
- **Barrier weld ultrasonic examination procedures shall be in accordance with Section V, Article 4, using Cladding Technique One. Calibration blocks shall be in accordance with Fig. T-434.4.2.2. The acceptance criteria of Section III, NB-5330 shall apply.**
- **Postulated flaw growth analyses with flaw depths ½ the minimum barrier weld thickness**

Comment #7
Barrier Weld Minimum Number of Layers

- **The barrier weld must be a minimum of 2 layers**
  - **Multiple layers reduce the possibility of flaw link up**
  - **The Case does not define layer thickness**
- **The sulfur mitigation layer(s) does not contribute to the barrier weld layers**

Comment Set #8
Detecting Alloy 600 Edges

- **The process must demonstrate the ability to detect the edges of the DMW, including butter if applicable (Alloy 600)**
  - **Experience at North Anna did not have a process to detect the actual edges of the Alloy 600**
- **The barrier weld must be applied past the DMW/butter edges 2X the demonstrated accuracy for edge detection or ¼", whichever is greater**
- **This requirement will ensure ALL of the Alloy 600 is isolated**
- **Eddy current and ferrite scopes are common examples of industry methods currently in use to find Alloy 600 boundaries, but the Case allows any process that can be demonstrated**
  - **Typical industry demonstrated accuracies for this application are in the .02" - .05" range**

Comment Set #9
Barrier Weld Chemistry

- **The barrier weld final surface shall contain at least 24% chromium**
- **Reference: Effect of Chromium Content on Nickel-Base Alloy SCC Resistance**
  - **SIR-05-030, Rev. 0, RRM-02-05, BC04-1003, Develop New Code Case to Address Inconel Weld Overlay on Various Materials**
  - **Report Recommendation: A conservative estimate of the threshold to mitigate PWSCC is 24%**

Comment #10
Barrier Weld Final Surface Condition

- **The Case makes no requirements for barrier weld final surface conditioning, beyond the required examination acceptance criteria**
- **Both the "corrosion resistant cladding" and "weld inlay" approach may leave an "as welded" or "machined" final surface**
- **The standard "weld inlay" approach is to use a machining operation to return the final surface to the "As Fabricated" condition**
- **The residual stresses resulting from the barrier weld installation process is accounted for in the flaw growth and structural analyses**

Comment #11
Pre-service and In-service Examination Requirements

- **Executive Committee Decisions**
  - **Remove Pre-Service and In-Service Examination requirements from both the Barrier Weld and WOL Cases**
  - **Examination Case N-XXX (BC07-514) (Letter Ballot record 8-09) is to be referenced by both the Barrier Weld and WOL Cases for Pre-Service and In-Service Examination requirements**
- **Task Group Inlay is following the directions of the Executive Committee**

Comment Set #12
Examination Diagram Figures

- **The examination diagram figures were removed with the Pre-Service and In-Service examination requirements. These figures are included in the examination Case N-XXX (BC07-514) (Letter Ballot record 8-09)**
- **The excavation and barrier weld surface and volume exam areas are defined in the Case text**
  - **The entire barrier weld must be examined, as well as ½" from each edge thereof**
  - **The figures do not seem to add clarification to what is defined in the text for barrier weld examination and we want to avoid having the same figures in two different Cases**

Comment Set #13
Prevent Repeat Inlay/Onlay Installation

- **Prior to the removal of the Pre-Service and In-Service examination requirements, the barrier weld case contained the following text for In-Service examination:**
  - **Any flaws detected in the barrier weld and/or DMW shall require DMW removal and replacement in accordance with the repair/replacement requirements of IWA-4000**
- **NRC proposed new text:**
  - **1.0(j) A new onlay or inlay shall not be installed over the existing weld inlay or onlay that has been in service.**
  - **Since this deals with In-Service requirements, this may be a discussion more appropriate for the examination Case N-XXX (BC07-514) (Letter Ballot record 8-09)**

LEGEND

NRC COMMENTS FOR CASE N-XXX (07-1682) REV B (JAN ’08) (Comments on mitigative inlay 12-17-07.doc)
NRC COMMENTS FOR CASE N-XXX (07-1682) REV 080107-1GRPEDITKSCOM (AUG ’07) (Copy of Inlay Comments.doc)
PROPOSED RESOLUTION from COMMENTS MITIGATION INLAY/CLADDING CODE CASE (Record # 07-1682) REV 080107-1GRPeditkscom (NOV ’07)
NRC ACTIONS:
ASME ACTIONS:
COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
1	11 MITIGATION COMMENT 5	“Design and Stress Analysis” and “Flaw Growth Evaluation” should be addressed in the Code Case. It is not clear whether the “basis document” will be readily available and whether this will contain requirements. IM-15 The type of stresses (compressive, tensile) that will be present at the interface between the edge of the barrier weld and the base metal should be provided. C Section 3.0(a)(1) states that “...Volumetric examination of the applicable DMW volume specified in Figure IWB-2500-8(c) shall be performed. If flaws are detected, exceeding the acceptance standards of Table IWB-3410-1 Category B-F, this Case shall not apply...” Section 3.0(a)(1) should require crack growth calculations for the case when a flaw is detected prior to weld inlay installation and is allowed to remain in service. The crack growth calculation shall be required to be performed to ensure that the flaw will not grow to an unacceptable size after weld inlay installation.	NRC ACTIONS: ASME ACTIONS: COMMENTS: The Case now specifies Design, Stress Analysis and Flaw Growth Evaluation requirements. Technical justification for these requirements will be included in the basis document.
2	5	Paragraph 1.0(c) states that DMW shall not contain pre-existing flaws exceeding the inservice examination acceptance standards of Table IWB-3514-2 and IWB-3514-3. This requirement implies that this code case is applicable	NRC ACTIONS: ASME ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		to DMW that contains flaws accepted by IWB-3514. This paragraph should be revised to clarify the following issues. T (a) The code case should be clear that an inlay/onlay can not be installed over an inside-surface connected flaw. Any inside-surface connected flaw would require repair. (b) The code case indicates that it does not apply if there are "volumetric pre-existing flaws" that exceed IWB-3514 values. Given that the Code Case specifies "volumetric" flaws, it is not clear whether this code case applies to circumferential and/or axial flaws.	COMMENTS:
	MITIGATION COMMENT 7	Section 3.0(a)(2) states that the code case shall not apply if the flaws detected in the DMW exceed the acceptance standards of Table IWB-3410-1 prior to inlay installation. However, the code case should not be used if the flaws are caused by PWSCC regardless of whether they satisfy the acceptance standards of Table IWB-3410-1. Section 3.0(a)(2) should be revised to include a requirement that PWSCC flaws are prohibited to remain in service.	Existing flaws within the specified acceptance criteria will be isolated from the primary environment by the barrier weld. Table IWB-3410-1 (which takes you to tables IWB-3514-2 and IWB-3514-3) is applicable. After successful installation of a barrier weld, there will be no rejectable flaws in service. The requirements in this Case are such that the barrier weld remains intact for the service life, preventing new PWSCC flaws.
3	3	Paragraph 1.0(a)(3) requires that the sulfur mitigation layer be considered pressure boundary. This requirement has significant implications. According to General Design Criteria 14 of 10 CFR 50, Appendix A, the reactor coolant pressure boundary needs to be designed, fabricated, erected and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. This means that the sulfur mitigation layer shall be maintained to provide structural integrity to the component. However, the design and examination requirements for the sulfur mitigation layer are not provided	NRC ACTIONS: ASME ACTIONS: COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
	GENERAL COMMENT	in the code case except paragraph 2.0(c), which is related to welding. Every requirement that is imposed on the barrier layer needs to be imposed on the sulfur mitigation layer in this code case. T Is credit given (structurally) for the stainless steel layer applied over the high sulfur material?	Yes, the Case defines this as "Sulfur Mitigation Layer" and is applied to mitigate the effects of high sulfur content (and other elements) on the weldability of Alloy 52M. This layer is part of the pressure boundary and is therefore structural. This layer is NOT part of the barrier weld.
4	MITIGATION COMMENT 3	Section 1.0 specifies the maximum final thickness of the weld inlay. Section 1.0 should also specify (a) the minimum weld inlay length (in the longitudinal direction and circumferential direction), and (b) whether the code case is applicable to circumferential or axial flaws in the DMW, embedded or surface connected.	NRC ACTIONS: ASME ACTIONS: COMMENTS: See #4. The barrier weld must be 360° circumferential. Longitudinal direction must cover ALL of the Alloy 600 (the entire DMW and butter, if applicable) plus a conservative safety margin on both sides. See #5. Flaws on the surface to be welded must meet the acceptance criteria of NB-5352. Existing flaws in the balance of the examination volume shall meet Section XI inservice examination acceptance criteria. The final surface examination shall meet the acceptance criteria of NB-5352. The final barrier weld ultrasonic examination shall meet the acceptance criteria of NB-5330, including HAZ if applicable. The remaining examination volume shall meet the acceptance criteria of Tables IWB-3514-2 and IWB-3514-3.
5	GENERAL	Are there different requirements if the inlay material is	NRC ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
	COMMENT GENERAL COMMENT	considered as cladding or as structural material? Is the inlay still considered mitigative if it is structural? Can cladding be considered structural in this application? If the inlay is treated as cladding (non-structural presumably), what cladding rules should be followed?	ASME ACTIONS: COMMENTS: For the purposes of this Case the mitigative barrier weld is considered to be structural. The barrier weld is considered to be structural, standard cladding rules do not apply. The Case defines the rules that are to be followed.
6	GENERAL COMMENT	The method for determining the weld inlay minimum thickness should be specified (the maximum thickness is specified). The basis for the minimum and maximum thickness should be discussed in the white paper.	NRC ACTIONS: ASME ACTIONS: COMMENTS: 1/8" minimum thickness. Minimum of 2 final weld layers to prevent flaw link up. Flaw growth evaluation is required to justify the min thickness. Stress analysis of the final configuration is required. Sample evaluations will be included and discussed in the basis document. Site specific evaluations will be required.
7	GENERAL COMMENT	Multiple layers prevent the link up of flaws. Do we need to specify a minimum number of layers?	NRC ACTIONS: ASME ACTIONS: COMMENTS: YES, minimum of 2 layers. (Min of 1/8" thickness.)
8	17	Paragraph 1.0(g) (and 3.0(d)(1)?) require that the barrier layer extend a minimum of ¼-inch (1/2-inch?) beyond the DWM edge. This might not be enough given the experience	NRC ACTIONS: ASME ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		at North Anna. IM-22	COMMENTS:
	GENERAL COMMENT	It is not clear how the installer would know the edge of the inside surface of the DMW within ¼ inch. In addition it is not clear that this will ensure that the susceptible material in the weld, weld butter, and the safe end (if applicable) will be completely isolated by the inlay.	The process must demonstrate the ability to detect the edges of the DMW, including butter if applicable (Alloy 600). The barrier weld must be applied past the DMW/butter edges 2X the demonstrated accuracy for edge detection or ¼", whichever is greater. This will ensure ALL of the Alloy 600 is isolated. Eddy current is typically used to find the edges of the Alloy 600, but the Case allows any process that can be demonstrated.
9	15	The basis for the 24% chromium requirement in 2.0(g) is weak. The inlay process will create large tensile ID stresses which will promote SCC. If 24% chrome is only borderline in terms of SCC resistance, it is possible that SCC will occur. If it does occur, it only has to grow through 6 mm of material (or possibly only 3 mm if 1.0(g) is correct) to expose the more susceptible material. It would seem that a higher chromium requirement is needed for an inlay. IM-9 There should be a minimum inlay/onlay thickness requirement with no dilution of the chromium content. It does not appear that just having 24% chromium in just the final surface is sufficient to resist SCC given that surface grinding may be performed. IM-19	NRC ACTIONS: ASME ACTIONS: COMMENTS:
	GENERAL COMMENT	The white paper should describe the corrosion resistance of the inlay material including the basis for the 28% chrome filler metal.	The Alloy 52 basis document provided for N-740 will be included in the basis document for this barrier weld Case.
10	21	Nothing is ever said about how surface grinding will be done in order to obtain a smooth surface for volumetric and PT inspections. Heavy grinding that increases the temperature to melting results in surface biaxial stresses. Grinding at a lower temperature (slower) will cause cold working and will	NRC ACTIONS: ASME ACTIONS: COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		result in compressive ID surface stresses. This is more important when there is only part of one weld bead that has 24% chromium as per 2.0(g). IM-18	
11	18	Paragraphs 3.0(e) and 3.0 (f) specify requirements for preservice examination and inservice examination, respectively. However, the contents of these two paragraphs were removed and replaced with a reference to Case N-XXX. Referencing a Code Case that has not been endorsed by the Committees in this draft code case which has not been endorsed does not make sense and does not serve the intended purpose. The NRC staff suggests that specific preservice and inservice examination requirements be included in paragraphs 3.0(e) and 3.0 (f). T	NRC ACTIONS: ASME ACTIONS: COMMENTS:
12	19	The examination diagrams of the weld in Section 3.0 have been removed. The NRC staff suggests that the diagrams be included in the code case. T	NRC ACTIONS: ASME ACTIONS: COMMENTS:
	MITIGATION COMMENT 1	Section 1.0 should include a diagram or drawing of the subject dissimilar metal weld with the weld inlay. The NDE volume/region/surface shall be identified in the drawing.	Surface exam area defined in text. Volumetric exam refers to Fig IWB-2500-8(c) for pre barrier weld, specifies barrier weld volume for acceptance and refers to figure for PSI and ISI.
13	10	The following new paragraph shall be added to prevent repeat use of the inlay and onlay repair. T Paragraph 1.0(j) *A new onlay or inlay shall not be installed over the existing weld inlay or onlay that has been in service.*	NRC ACTIONS: ASME ACTIONS: COMMENTS:
	MITIGATION COMMENT 2	Section 1.0 should include a requirement to prohibit installing a weld inlay onto an existing weld inlay.	Inservice Examination: Any flaws detected in the barrier weld and/or DMW shall require DMW removal and replacement in accordance with the repair/replacement requirements of IWA-4000.

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
14	22	Will the stress limits in Section 3 still be satisfied after excavation? There should be requirements to verify this. IM-x	NRC ACTIONS: ASME ACTIONS: COMMENTS:
15	1 GENERAL COMMENT	In the Reply (or in the Code itself), mitigation should be defined (see related comment on N-740-2). IM-10 Need a better distinction between mitigative and repair weld inlay. Consistency should be achieved between the N-740 definition and this definition.	NRC ACTIONS: ASME ACTIONS: COMMENTS: Several details have been added to the Case that defines a mitigative barrier weld.
16	2	Paragraphs 1.0(a)(2)(i) and (ii) define the inlay barrier weld and onlay barrier weld, respectively. It seems that paragraphs 1.0(g) and 1.0(h), which provides thickness requirement, are only applicable to the weld inlay (i.e., there are no requirements for the weld onlay thickness). As a result, paragraphs 1.0(g) and 1.0(h) should be revised to clearly specify the barrier layer thickness for the weld inlay and onlay design. In addition, it is not clear whether the onlay thickness will affect the fluid flow inside small bore piping (e.g., potential for turbulence and vortex generation, flow restriction). As a result, it is not clear whether the code case should be applicable to small bore piping. Lastly, it is not clear whether the weld onlay will be affected by the higher fluid flow (and whether there should be requirements to address this). T	NRC ACTIONS: ASME ACTIONS: COMMENTS:
17	4	Paragraph 1.0(b) indicates that this Case is applicable to austenitic stainless steel welds. It is not clear why it is	NRC ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		applicable to such welds given that the inlay/onlay only extends ¼-inch beyond the DMW. IM5	ASME ACTIONS: COMMENTS:
18	6	How is the measurement method for determining the distance between the surface to be welded and the ferritic steel based material demonstrated (as discussed in paragraph 1.0(d)). IM-23	NRC ACTIONS: ASME ACTIONS: COMMENTS:
19	7 GENERAL COMMENT	It is not clear that the fluence in 1.0(e) is correct. Please verify (see related comment on N-740-2). IM-11 The thermal fluence in the code case and the voltage of the thermal neutrons should be made consistent with N-740, Revision 1.	NRC ACTIONS: ASME ACTIONS: COMMENTS: This Case shall be limited to applications predicted not to have exceeded a thermal neutron fluence of 1×10^{17} ($E < 0.5$ eV) neutrons per cm^2 on the material prior to barrier welding.
20	8	This code case allows excavation of the DMW, which may affect the structural integrity of thin wall piping. There should be a limitation imposed on the thickness of the pipe that can be repaired using this code case. For example, excavating a thin pipe that has a thickness of say 0.375 inches may cause unintended consequences (e.g., if excavation is more than 50% of pipe). T What are the guidelines for determining the excavation depth? Is the thickness of the inlay/onlay the only guideline? IM-6	NRC ACTIONS: ASME ACTIONS: COMMENTS:
21	9	Paragraph 1.0(g) specifies the minimum thickness and paragraph 1.0(h) specifies the maximum thickness of the	NRC ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		barrier layer. It seems that the maximum and minimum thickness do not consider the thickness of the sulfur mitigation layer. The exact thickness of the inlay is important because if the thickness exceeds the maximum allowable, the thermal and residual stresses may cause unintended consequences. Revise Paragraphs 1.0(g) and 1.0(h) to clarify the issue. T Paragraph 1.0(g) is difficult to read. Suggest "The excavation depth shall be greater than 1/8-inch (3 mm)." IM-21	ASME ACTIONS: COMMENTS:
22	12	Paragraph 2.0(c) is confusing. Can A82 be deposited before the E309L? IM-7	NRC ACTIONS: ASME ACTIONS: COMMENTS:
23	13	Paragraph 2.0(d) should be revised to read, "The barrier weld shall consist of at least two (2) <u>barrier</u> layers after final surface preparation. The machine gas tungsten arc welding (GTAW) process shall be used." The word, "barrier" is added to distinguish the difference between the barrier layer and sulfur mitigation layer, if there is a difference. If there is no difference in terms of protecting the structural integrity of the component, the requirement still needs to be revised to clarify whether the sulfur mitigation layer is considered as part of the 2 layers. T Paragraph 2.0(d) suggests that the inlay/onlay will be at least 6 mm (assuming 3 mm per weld layer). Paragraph 1.0(g), however, suggests that 3 mm is the minimum. IM-8	NRC ACTIONS: ASME ACTIONS: COMMENTS:
24	14	Because sulfur mitigation layer uses austenitic stainless steel	NRC ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		filler metal, the following requirement must be added to Section 2.0 to be consistent with ASME Code Case N-504-2, paragraph (e): 2.0(i) The austenitic stainless steel weld overlay shall consist of at least two weld layers having as-deposited delta ferrite content of at least 7.5 FN. The first layer of weld metal with delta ferrite content of at least 7.5 FN shall constitute the first layer of the weld reinforcement that may be credited toward the required thickness. Alternatively, first layers of at least 5 FN are acceptable, provided the carbon content of the deposited weld metal is determined by chemical analysis to be less than 0.02%. [Taken from Code Case N-740-2 verbatim]	ASME ACTIONS: COMMENTS:
25	16	It seems that the examination requirements of Section 3.0 apply to the barrier layer only and not to the sulfur mitigation layer. As defined in paragraph 1.0(a)(3), the sulfur mitigation layer is considered as part of the pressure boundary. As a result, the examination requirements imposed on the barrier layer need to be applied to the sulfur mitigation layer. Therefore, the phrase "sulfur mitigation layer" needs to be included in all the paragraphs and subparagraphs in Section 3.0. T	NRC ACTIONS: ASME ACTIONS: COMMENTS:
26	20	Appendix I, Paragraph 1.0(a) allows the maximum area of an individual barrier weld based on the finished surface over the ferritic base material be 500 square inches. It seems that the industry's technical basis for the 500 square inch weld area is based on the analysis of the weld covering outside surface of the pipe (i.e., weld overlay). (Reference, EPRI report 1014351, " Topical Report Supporting an Expedited NRC review of the Content of the Code Case Needed for Dissimilar Metal Weld Overlay Repairs." The industry	NRC ACTIONS: ASME ACTIONS: COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
	MITIGATION COMMENT 10	needs to confirm that an analysis is performed to support the acceptability of the inlay or onlay of 500-square-inch weld area. T Appendix 1, Section 1.0(a) specifies that "...The maximum area of an individual weld inlay based on the finished surface over the ferritic base material shall be 500 sq. in..." The technical basis for the 500 square inch area was based on a finite element model of a weld overlay, not inlay. It was shown in the finite element analysis that the weld overlay will generate compressive stresses in the inner region of the pipe wall thickness which will limit the growth of the flaw that originates from the inside surface. The finite element analysis also showed that the outer region of the pipe would be under tensile stresses. However, it is not clear what the stress distribution of the pipe would be after the weld inlay application. The white paper should discuss the basis for concluding that the weld inlay will not cause an existing flaw to propagate to an unacceptable size (e.g., through a finite element analysis).	This will be addressed in the basis document.
27	23	A reference to Section IX qualifications should be included in the Code Case for cases when temperbead welding is not used (e.g., possibly when welding between stainless steel and Alloy 600 with Alloy 52 weld wire). C	NRC ACTIONS: ASME ACTIONS: COMMENTS:
28	24	What is the thickness used in determining the acceptability of the flaws in the inlay/onlay? Will it be the inlay/onlay thickness or the full weld thickness? L	NRC ACTIONS: ASME ACTIONS: COMMENTS:
29	25	The user should be allowed to determine the interpass	NRC ACTIONS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		temperature with thermocouples or contact pyrometers. The methods in the code case should only be used as an exception. A	ASME ACTIONS: COMMENTS:
30	GENERAL COMMENT	Several performance criteria for mitigative weld inlays and mechanical stress improvement were developed by a task group that reports to the subgroup on evaluation process. At a minimum, the technical basis paper and the code case should address the applicable performance criteria. These criteria are attached.	NRC ACTIONS: ASME ACTIONS: COMMENTS: The criteria for inlays and CRC (barrier weld) has been addressed and added to the Case where appropriate. The basis document will address the technical justifications.
31	GENERAL COMMENT	The examination requirements for upper head repairs should be reviewed for insights into the appropriate inspection requirements for inlays.	NRC ACTIONS: ASME ACTIONS: COMMENTS: Examination requirements for upper head repairs have been considered. For weld barrier, structural acceptance criteria per Section III, NB-5330 (ultrasonic) and NB-5352 (surface examination) seems appropriate. Ultrasonic examination procedures shall be in accordance with Section V, Article 4, using Cladding Technique One. Calibration blocks shall be in accordance with Fig. T-434.4.2.2.
32	GENERAL COMMENT	Are additional restrictions necessary if the inlay is in close proximity to ferritic material?	NRC ACTIONS: ASME ACTIONS: COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
			Ambient temperature Temper bead welding is required if the barrier weld is 1/8" or less away from ferritic material.
33	GENERAL COMMENT	There are statements that certain "items" (e.g., temper bead welding) may be required. The instances when these "items" would be required should be specified.	NRC ACTIONS: ASME ACTIONS: COMMENTS: The Case specifically defines when ambient temperature temper bead welding is required.
34	GENERAL COMMENT	Are there other code cases that would permit inlays? If so, which ones? Have the appropriate requirements from these code cases been included in this document.	NRC ACTIONS: ASME ACTIONS: COMMENTS: No, there are no Cases or rules that address all the requirements for this specific application.
35	GENERAL COMMENT	The 48 hr hold requirement should be consistent with past NRC approvals.	NRC ACTIONS: ASME ACTIONS: COMMENTS: Rules for ambient temperature temper bead are consistent with N-740 and past NRC approvals for GTAW process.
36	MITIGATION COMMENT 4	Section 1.0 states that "...The DMW shall contain no pre-existing defects..." However, Sections 3.0(a)(1) and 3.0(b)(1) allow flaws to remain in DMW if the flaws satisfy certain acceptance criteria prior to installing weld inlay. The discrepancy between Sections 1.0 and 3.0 should be	NRC ACTIONS: ASME ACTIONS: COMMENTS:

#	SOURCE	COMMENTS	PROPOSED RESOLUTION
		resolved.	We believe this discrepancy has been resolved in the revised version.
37	MITIGATION COMMENT 6	Section 3.0(b)(1) states that "...Liquid penetrant or eddy current examination shall be performed. Acceptance criteria shall be in accordance with Section III, NB-5350. If this acceptance criteria cannot be met this Case shall not apply..." ASME Section III, NB-5350 provides acceptance criteria for liquid penetrant tests only and not for the eddy current examinations (based on the 2001 edition of the ASME Code, Section III). Specify the acceptance criteria for the eddy current examinations. This comment also applies to Section 3.0(c)(1) in which the acceptance criteria for eddy current examination are not specified.	NRC ACTIONS: ASME ACTIONS: COMMENTS: The intent is to require the same acceptance criteria for either PT or ET. The reference in the new Case revision has been changed to the acceptance criteria defined in NB-5352, which is consistent with Case BC07-514.
38	MITIGATION COMMENT 8	Sections 3.0(c)(1) and 3.0(d)(1) state that if ambient temperature temper bead welding is used, the examinations shall be conducted at least 48 hours after the completion of the third temper bead layer over the ferritic steel base metal. Does this requirement apply if the weld inlay has one or two temper bead layers? If not, what would be the hold time for the NDE and at what point of the welding procedures would the NDE be performed?	NRC ACTIONS: ASME ACTIONS: COMMENTS: Ambient temperature temper bead welding requires a min of 3 applied layers (1/8 in min applied thickness). This is well defined in Appendix 1. NDE would be performed no sooner than 48 hrs after completion of the third temper bead layer is now specified in the revised version.
39	MITIGATION COMMENT 9	Section 3.0 should include requirements for successive examinations and inspection expansion if a flaw is detected in the weld inlay or DMW and is dispositioned to remain in service during the acceptance examination, preservice examination, or inservice examination.	NRC ACTIONS: ASME ACTIONS: COMMENTS: Additional examinations have been included for this scenario.