



U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

NRC Public Meeting on N-770-1 Implementation

Rockville, MD

July 12th, 2011

Jay Collins

Division of Component Integrity
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

Agenda

- Introductions 9:00 – 9:15am
- Presentation 9:15 – 10:15am
- Break 10:15 – 10:30am
- Q&A 10:30 – 11:30am
- Public Comments 11:30 – 11:45am
- Lunch 11:45 – 1:00pm
- Q&A (optional) 1:00 – 2:00pm

Questions

- Due to the complexity of this topic, we do expect questions
 - Please hold your questions until the end of the presentation
 - Note cards have been provided
 - Please print your question on a note card so we can ensure we have correctly captured the item
 - If applicable, please note the slide number

Introduction

- 10 CFR 50.55a(g)(6)(ii)
 - The Commission may require the licensee to follow an augmented inservice inspection program for systems and components for which the Commission deems that added assurance of structural reliability is necessary.
- 10 CFR 50.55a(g)(6)(ii)(F)
 - *Examination requirements for class 1 piping and nozzle dissimilar-metal butt welds.*

Addressing Public Comments

- Proposed Rule issued on May 4, 2010.
- Statement of Considerations
 - Comments resulting in changes to the proposed regulations; and
 - Comments raising important issues but which the NRC declined to adopt;
 - All comments and responses are available in ADAMS, Accession No. ML110280240.

N-770 to N-770-1

- The final rule incorporates Code Case N-770-1
 - led to about half the proposed conditions on the use of Code Case N-770 being removed.
 - Disposition of changes in ML111250292
 - One new condition was imposed, 50.55a(g)(6)(ii)(F)(10), due to a technical change in N-770-1 that was not available for public review and comment.

Implementation Timeline

- 10 CFR 50.55a(g)(6)(ii)(F)(1)
 - Licensees of existing, operating pressurized-water reactors as of July 21, 2011, shall implement the requirements of ASME Code Case N-770-1, subject to the conditions specified in paragraphs (g)(6)(ii)(F)(2) through (g)(6)(ii)(F)(10) of this section, by the first refueling outage after August 22, 2011.

50.55a(g)(6)(ii)(F)(2)

- Full structural weld overlays authorized by the NRC staff may be categorized as Inspection Items C or F, as appropriate.
- Mechanical Stress Improvement Process™
 - May be categorized as Inspection Items D or E, as appropriate.
 - Also, must meet criteria in Appendix I of the code case.

Example 1

- Plant with full structural weld overlays
 - Weld categorization changes to C or F of N-770-1 during the first refueling outage starting after August 22, 2011
 - However, the inspection requirements of the NRC approved alternative for installation of each overlay remains in effect through its initial authorized 10-year inspection interval
 - Inspection requirements only change to N-770-1 after the proposed alternative's initial authorized 10-year inspection interval has ended

Example 2

- Plant with MSIP™ welds
 - With no cracking, category D of N-770-1, with condition § 50.55a(g)(6)(ii)(F)(9), requires initial inspection of all welds between 3 outages to 10 years after application
 - For each individual MSIP™ weld,
 - If an initial inservice inspection was performed, and
 - The inspection meets required inspection coverage of § 50.55a(g)(6)(ii)(F) and was within 3 outages to 10 years of application,
 - Then the initial inspection requirement for category D of N-770-1 is met for that weld

Example 2 (cont.)

- Plants with MSIP™ welds (cont.)
 - With cracking identified, category E of N-770-1 requires initial inspection during the 1st or 2nd refueling outage after application
 - For each individual MSIP™ weld,
 - If an initial inservice inspection was performed, and
 - The inspection meets the required inspection coverage of § 50.55a(g)(6)(ii)(F) and was performed during the 1st or 2nd refueling outage after application,
 - Then the initial inspection requirement for category E of N-770-1 is met for that weld

50.55a(g)(6)(ii)(F)(2) (cont.)

- All other butt welds that rely on Alloy 82/182 for structural integrity
 - Shall be categorized as Inspection Items A-1, A-2 or B until
 - NRC authorizes a new Inspection Item category for each mitigated weld through a 10 CFR 50.55a(a)(3)(i) alternative, or
 - The weld is mitigated in accordance with a code case, endorsed in Regulatory Guide 1.147, and incorporated in this section

50.55a(g)(6)(ii)(F)(3)

- Baseline examinations for Inspection Items A-1, A-2, and B,
 - Must be completed by the end of the next refueling outage starting after January 20, 2012
 - Previous examinations can be credited if
 - By applying the N-770-1 inspection frequency, the next inspection could be performed in one or more outages beyond the first outage starting after January 20, 2012, and
 - Met Section XI, Appendix VIII requirements, including examination volume of essentially 100%.

50.55a(g)(6)(ii)(F)(3) (cont.)

- Baseline examinations for Inspection Items A–1, A–2, and B, (cont.)
 - Other previous examinations that do not meet the preceding requirements can be used to meet the baseline examination requirement provided
 - NRC approval of alternative inspection requirements in accordance with paragraphs (a)(3)(i) or (a)(3)(ii) of this section is granted prior to the end of the next refueling outage starting after January 20, 2012.

50.55a(g)(6)(ii)(F)(3) (cont.)

- Additional factors in regards to baseline examinations
 - (g)(6)(i) relief under impracticality is not applicable to requirements under (g)(6)(ii).
 - NRC staff will prioritize review of relief requests based on outage schedule.
 - Until baseline examinations are required to be performed, NRC expects each licensee to perform inspections in accordance with current industry guidance

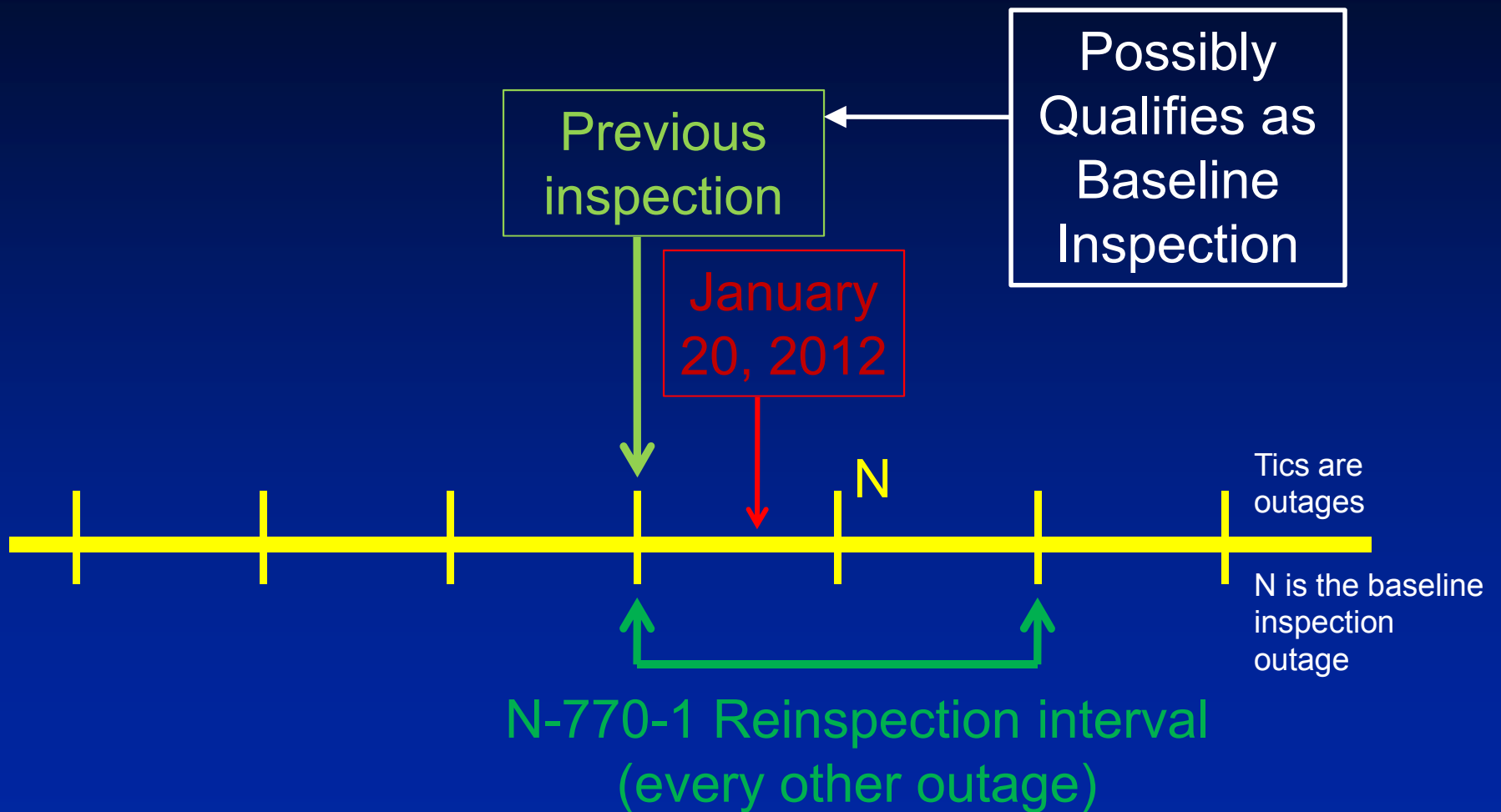
Example 3

- Welds mitigated by Inlays or Onlays
 - Categorized as A-1, A-2 or B under N-770-1
 - Requires submittal to the NRC of a request to change from category A-1, A-2 or B to category G, H, J or K as appropriate under 10 CFR 50.55a(a)(3)(i)
 - Request should include information similar to requirements in ASME Code Case N-766
 - Design and implementation details
 - NDE performed, results and acceptance criteria

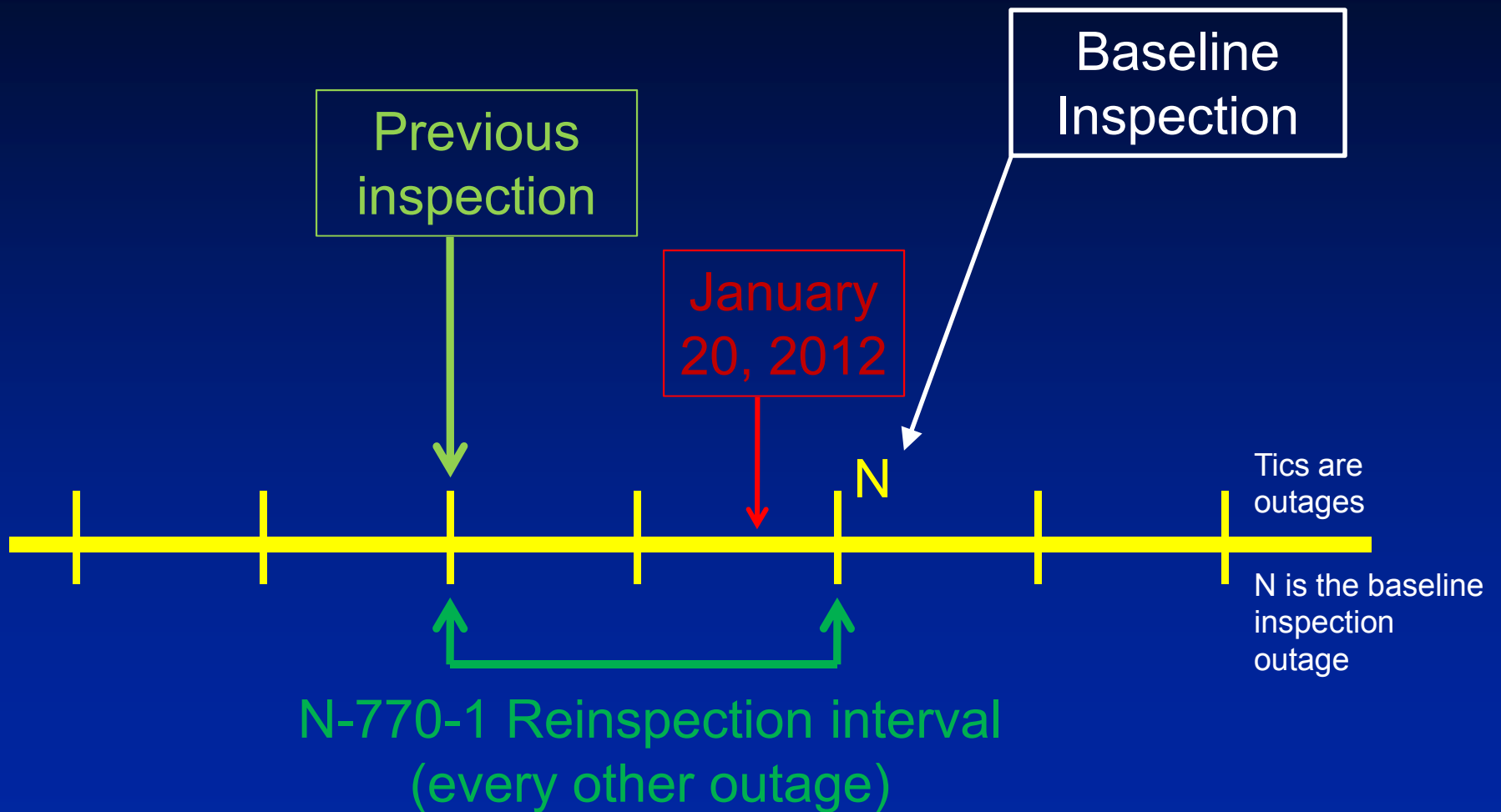
Example 4a

- Category A-1 Welds
 - A previous examination may be credited as meeting the baseline inspection requirement of § 50.55a(g)(6)(ii)(F)(3), if
 - Inspected in the previous outage before the required N-770-1 baseline inspection,
 - Relief will be required if previous inspection does not meet Section XI, Appendix VIII requirements, including examination volume of essentially 100%.

Example 4a(1) A-1 Welds



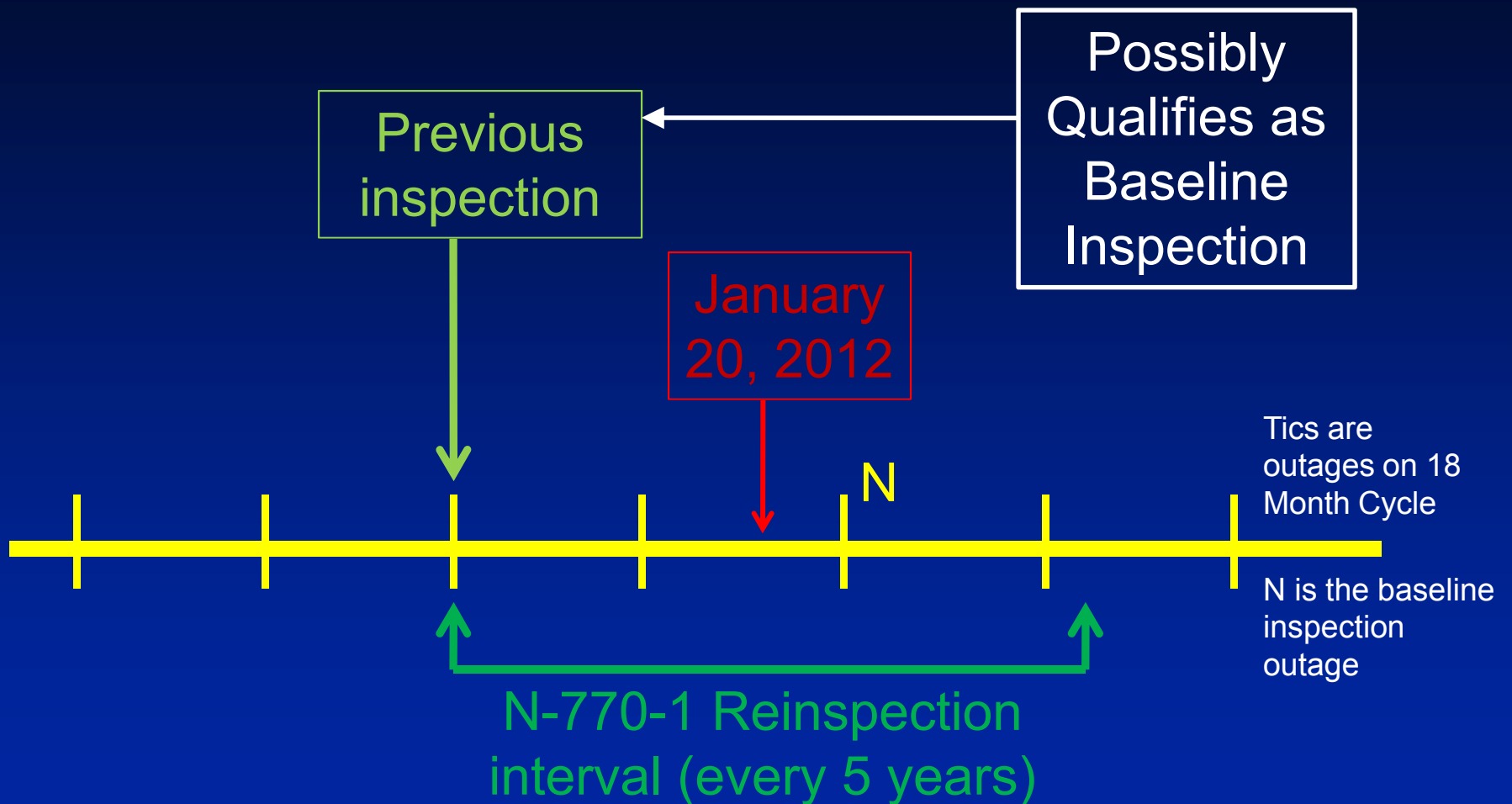
Example 4a(2) A-1 Welds



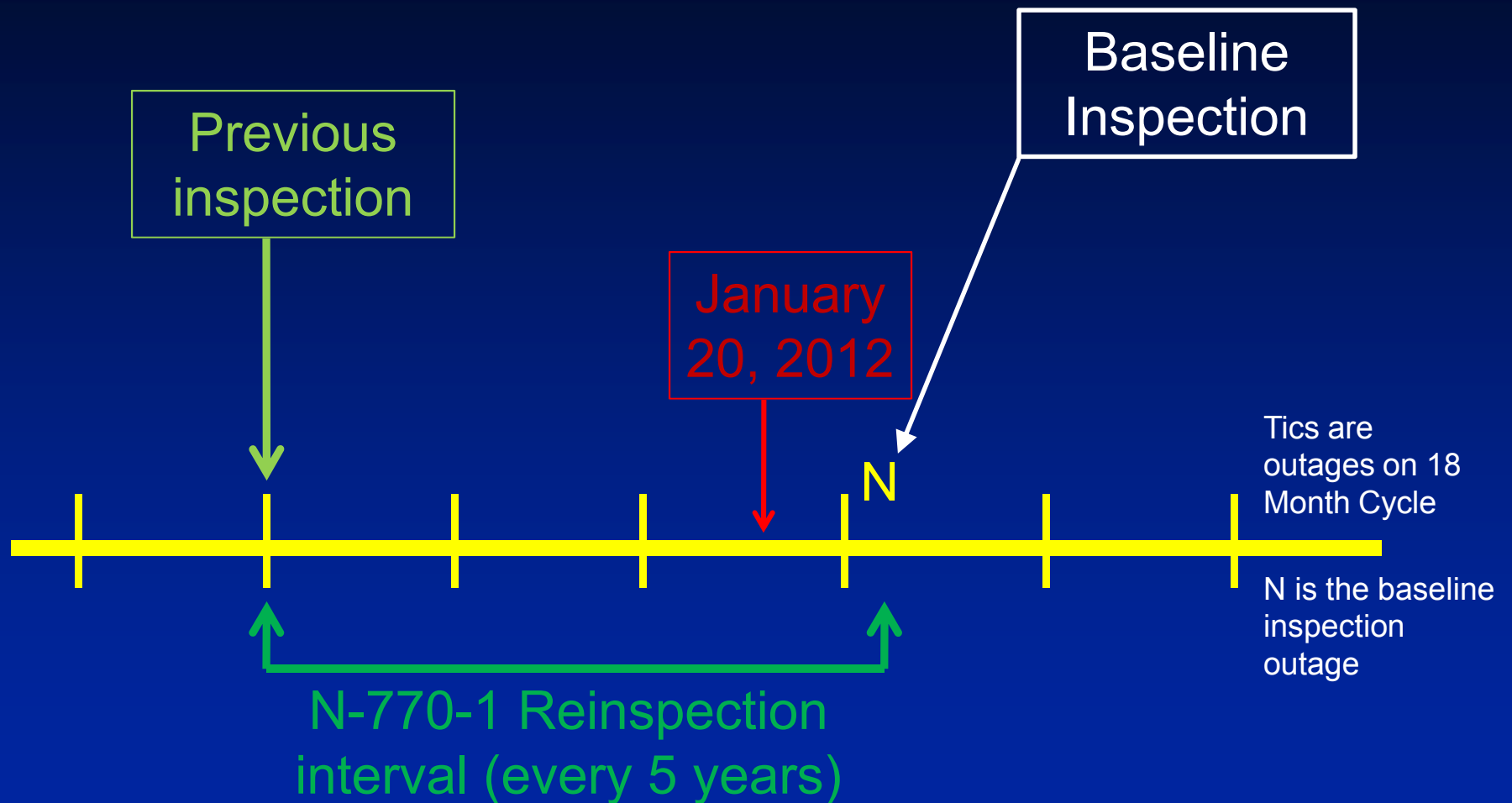
Example 4b

- Category A-2 Welds
 - A previous examination may be credited as meeting the baseline inspection requirement of § 50.55a(g)(6)(ii)(F)(3), if
 - By applying the N-770-1 inspection frequency of every 5 years, the next inspection could be performed in one or more outages beyond the first refueling outage starting after January 20, 2012
 - Relief will be required if previous inspection does not meet Section XI, Appendix VIII requirements, including examination volume of essentially 100%.

Example 4b(1) A-2 Welds



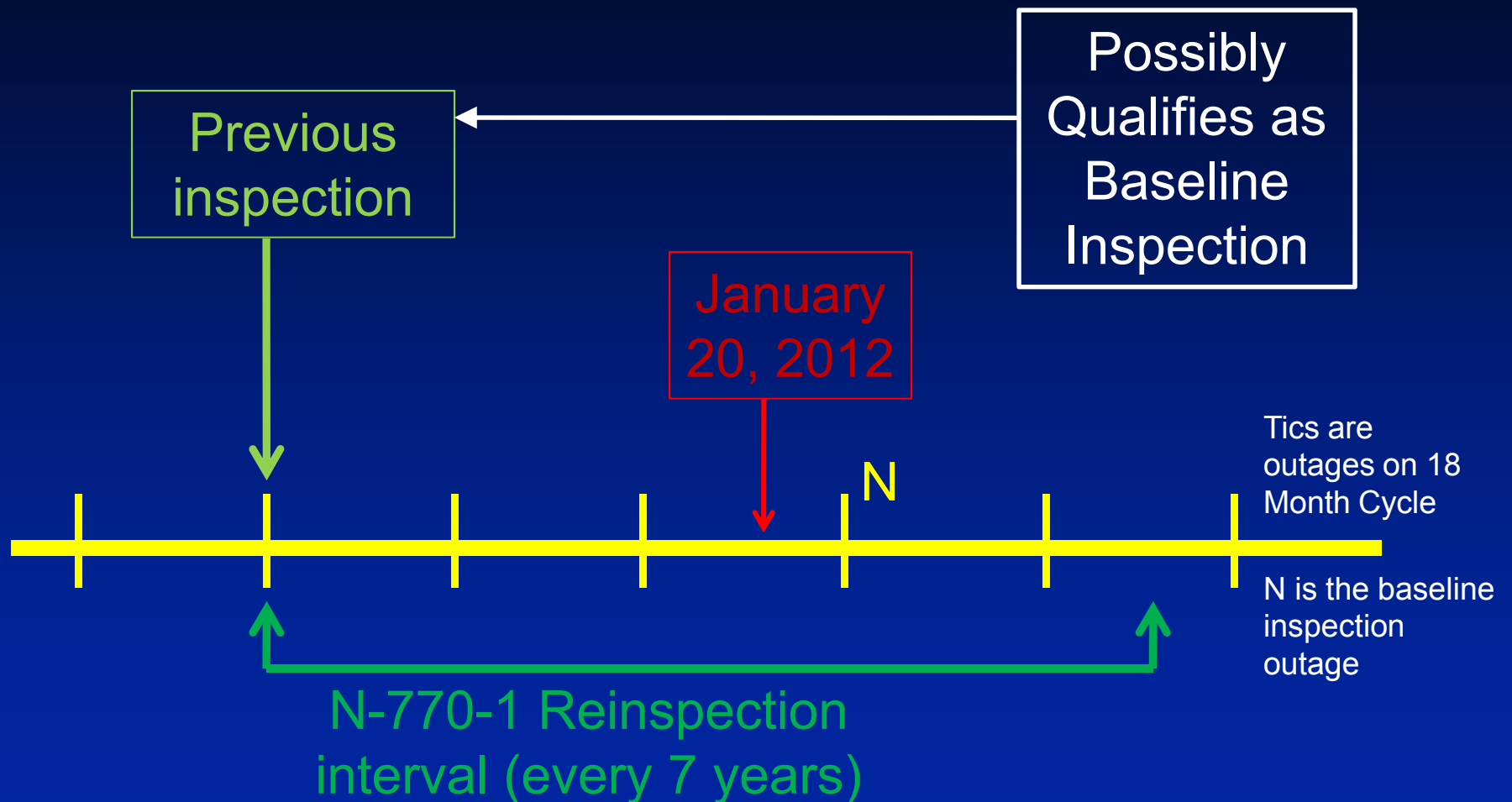
Example 4b(2) A-2 Welds



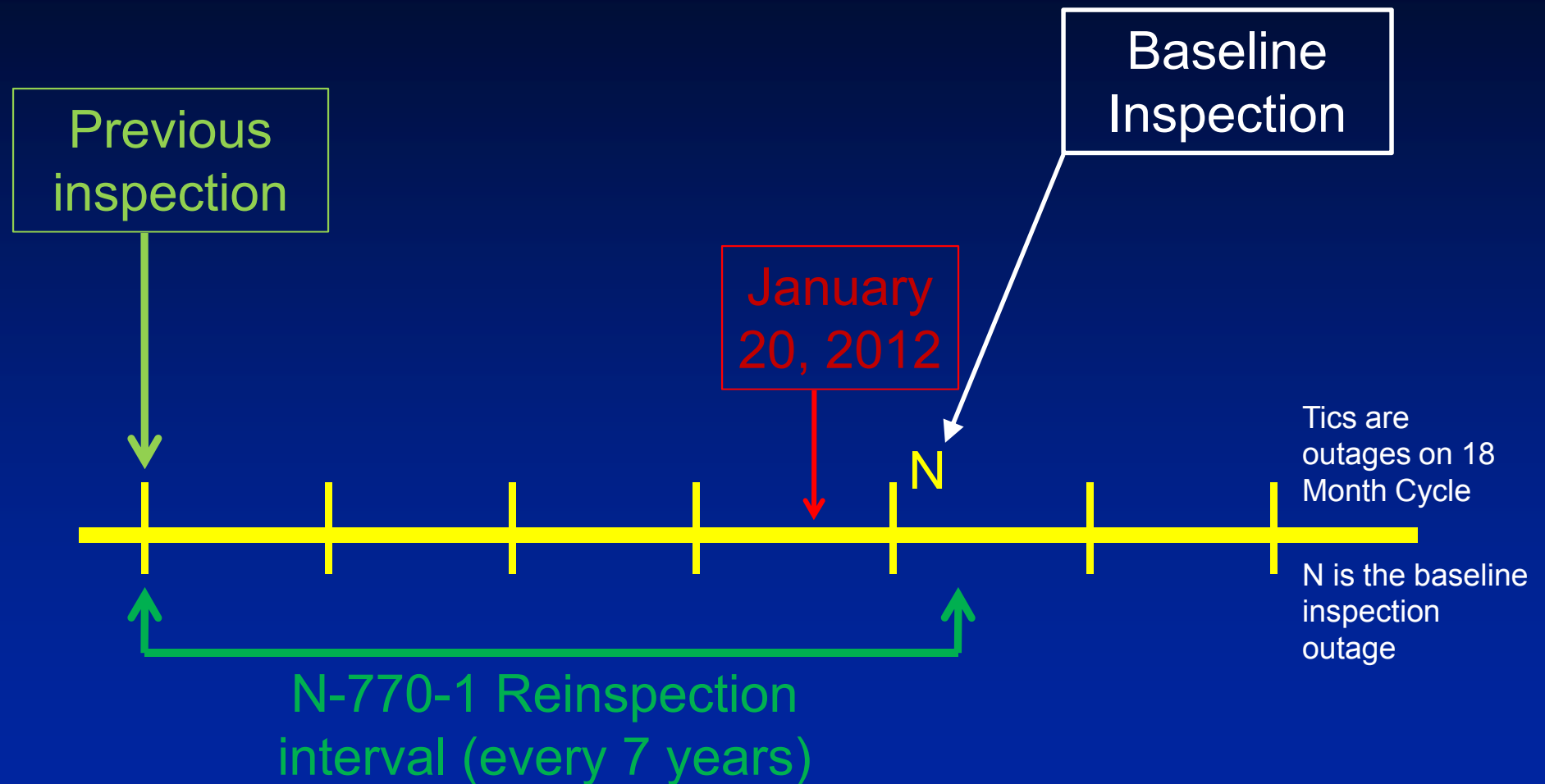
Example 4c

- Category B Welds
 - A previous examination may be credited as meeting the baseline inspection requirement of § 50.55a(g)(6)(ii)(F)(3), if
 - By applying the N-770-1 inspection frequency of every 7 years, the next inspection could be performed in one or more outages beyond the first refueling outage starting after January 20, 2012
 - Relief will be required if previous inspection does not meet Section XI, Appendix VIII requirements, including examination volume of essentially 100%.

Example 4c(1) B Welds



Example 4c(2) B Welds



Example 5

- To recategorize welds that are mitigated with techniques other than full structural weld overlays or MSIP™
 - If mitigation is approved for use in Regulatory Guide 1.147, welds can be recategorized as defined in Regulatory Guide 1.147, and no other action is required.
 - Otherwise a request for recategorization under § 50.55a(a)(3)(i) is required
 - Can be part of a licensee's proposed alternative

Requirements (cont.)

- 50.55a(g)(6)(ii)(F)(4)
 - Paragraph -2500(c) may not be used to reduce volumetric inspection coverage
- 50.55a(g)(6)(ii)(F)(5)
 - Inspection Items G, H, J, and K
 - Pressurizer and hot-leg welds inspected each interval.
 - Cold-leg welds require a 25% sample whenever the core barrel is removed, unless the welds were already inspected within the past 10 years. The sample must be inspected at least every 20 years.

50.55a(g)(6)(ii)(F)(6)

- For inservice inspection of mitigated welds, if
 - Growth of existing flaws exceeds the previous IWB-3600 flaw evaluations, or
 - New flaws detected.
- Then
 - Provide report that summarizes licensee's evaluation to NRC, prior to Mode 4, with
 - inputs, methodologies, assumptions, and
 - cause of new flaw or flaw growth.

50.55a(g)(6)(ii)(F)(7)

- Inspection Items G, H, J, and K
 - When applying the acceptance standards of ASME B&PV Code, Section XI, IWB–3514, for planar flaws contained within the inlay or onlay, the thickness “t” in IWB– 3514 is the thickness of the inlay or onlay.
 - For planar flaws in the balance of the dissimilar metal weld examination volume, the thickness “t” in IWB-3514 is the combined thickness of the inlay or onlay and the dissimilar metal weld.

50.55a(g)(6)(ii)(F)(8)

- Inspection Items D and E
 - Welds mitigated by optimized weld overlays are not permitted to be placed into a population to be examined on a sample basis.
 - Optimized weld overlays must be examined once each inspection interval.

50.55a(g)(6)(ii)(F)(9)

- Inspection Item D – Extent and Frequency of Examination
 - Replace;
 - Examine within 10 yr following stress improvement application. If multiple welds are mitigated in the same inspection period, examinations shall be spread throughout years 3 through 10 following application, similar to provisions in -2410(c).
 - With;
 - Examine all welds no sooner than the third refueling outage and no later than 10 years following stress improvement application.

50.55a(g)(6)(ii)(F)(9) (cont.)

- Note (11)(b)(2)
 - Replace
 - The first examinations following weld inlay, onlay, weld overlay, or stress improvement for Inspection Items E through K shall be performed as specified. For Inspection Item D, the first examinations following stress improvement may be performed any time within 10 yr following mitigation.
 - With
 - The first examination following weld inlay, onlay, weld overlay, or stress improvement for Inspection Items D through K shall be performed as specified.

50.55a(g)(6)(ii)(F)(10)

- Note (b) to Figure 5(a), alternative examination volume for optimized weld overlays, may not be applied unless NRC authorizes use under paragraphs (a)(3)(i) or (a)(3)(ii) of this section.
- NRC has no issues with the item, however it is a technical change in transitioning from N-770 to N-770-1 that did not have the opportunity for public review/comment.

Going Forward

- Staff resources will be available to address expected relief requests to support plant outages.
- Staff will prioritize review of relief requests based on outage schedule.
- Q&A document within 30 days of meeting.
- 15 minute break and then start Q&A portion of the meeting