Table of Second Interval Requests for Relief

Request Number	Status as of 10/01/2002
NDE-1	Denied, withdrawn
NDE-2	Granted 10/15/1998
NDE-3	Superseded by NDE-3, R-1; withdrawn
NDE-3, R1	Granted 10/15/1998
NDE-4	Granted 10/15/1998
NDE-5	Granted 10/15/1998
NDE-6	Supersed by NDE-6A and NDE-6B, withdrawn
NDE-6A	Denied, withdrawn
NDE-6B	Granted 10/15/1998
NDE-7	Denied, withdrawn
NDE-8	Superseded by NDE-8, R1
NDE-8, R1	Granted 10/15/1998
NDE-9	Granted 10/15/1998
NDE-10	Withdrawn, to be superseded by outage specific requests
NDE-11	Withdrawn, to be superseded by outage specific requests
NDE-11.1R9	Approved 08/08/2000 (PGE LTR DCL-99-082 available in EDMS and RMS)
NDE-12	Withdrawn, to be superseded by outage specific requests
NDE-12.1R9	Approved 08/08/2000 (PGE LTR DCL-99-082 available in EDMS and RMS)
NDE-12.2R8	Approved 9/29/1999 (PGE LTR DCL-99-008 available in EDMS and RMS)
NDE-13	Withdrawn, to be superseded by outage specific request
NDE-13.1R8	Granted 10/15/1998
NDE-13.1R9	Approved 08/08/2000 (PGE LTR DCL-99-082 available in EDMS and RMS)
NDE-13.2R8	Approved 9/29/1999 (PGE LTR DCL-99-008 available in EDMS and RMS)
NDE-13.2R9	Approved 07/14/2000 (PGE LTR DCL-99-163 available in EDMS and RMS)
NDE-14	Superseded by NDE-14, R1; withdrawn
NDE-14, R1	Withdrawn, to be superseded by outage specific request
NDE-14 1R9	Approved 08/08/2000 (PGE LTR DCL-99-082 available in EDMS and RMS)
NDE-14.2R8	Approved 9/29/1999 (PGE LTR DCL-99-008 available in EDMS and RMS)
NDE-15	Granted 10/15/1998
NDE-15 2R9	Approved 07/14/2000 (PGE LTR DCL-99-163 available in EDMS and RMS)
NDE-16	Granted 10/15/1998
NDE-17	Superseded by NDE-17, R1; withdrawn
NDE-17, R1	Granted 10/15/1998
NDE-18	Superseded by NDE-18, R1; withdrawn
NDE-18, R1	Granted 10/15/1998
NDE-19	Superseded by NDE-19, R1; withdrawn
NDE-19, R1	Granted 10/15/1998
NDE-20	Superseded by NDE-20, R1; withdrawn
NDE-20, R1	Granted 10/15/1998
NDE-21	Withdrawn, to be supersed by outage specfic requests
NDE-21.1R8	Granted 10/15/1998
NDE-21.1R9	Approved 08/08/2000 (PGE LTR DCL-99-082 available in EDMS and RMS)

Table of Second Interval Requests for Relief

Request Number	Status as of 10/01/2002
NDE-22	Granted 10/15/1998
NDE-22.2R8	Approved 9/29/1999 (PGE LTR DCL-99-008 available in EDMS and RMS)
NDE-23	Withdrawn pending specfic application need
NDE-24	Withdrawn pending specfic application need
NDE-25	Granted 10/15/1998
NDE-25.2R8	Approved 9/29/1999 (PGE LTR DCL-99-008 available in EDMS and RMS)
NDE-26	Superseded by NDE-26, R1; withdrawn
NDE-26, R1	Granted 10/15/1998
NDE-27	Denied, withdrawn
NDE-28	Withdrawn, examination complete
NDE-29	Granted 10/15/1998
NDE-30	Granted 10/15/1998
NDE-31	Granted 10/15/1998
NDE-33.2R9	Approved 07/14/2000 (PGE LTR DCL-99-163 available in EDMS and RMS)
N-416-1	Approved 6/13/1995
PRS-1	Superseded by PRS-1A through 1F; withdrawn
PRS-1A	Granted 10/15/1998
PRS-1B	Authorized 5/23/1997
PRS-1C	Superseded by PRS-1C, R1; withdrawn
RRS-1C, R1	Authorized 5/1/1998
PRS-1D	Superseded by PRS-1D, R1; withdrawn
PRS-1D, R1	Approved 03/16/2000 (PGE LTR DCL-99-162 available in EDMS and RMS)
PRS-1E	Authorized 5/1/1998
PRS-1F	Authorized 5/1/1998
PRS-2	Superseded by PRS-2, R1; withdrawn
PRS-2, R1	Authorized 10/15/1998
PRS-3	Authorized 10/15/1998
PRS-4	Superseded by PRS-4, R1; withdrawn
PRS-4, R1	Authorized with additional requirement 10/15/1998
PRS-5	Denied, withdrawn.
PRS-5, R1	03/19/1999, withdrawn (PGE LTR DCL-99-046 available in EDMS and RMS)
PRS-6	Approved 10/19/2000 (PGE LTR DCL-00-092/192 available in EDMS and RMS)
CNT-1	Denied, withdrawn.
DOC-1	Withdrawn
RIISI	Approved 11/08/2001 (PGE LTR DCL-01-015 available in EDMS and RMS)
CRDR-1	Approved 06/05/2001 (PGE LTR DCL-01-057 available in EDMS and RMS)

WITHDRAWN 12/11/98

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-1

System/Component for Which Relief is Requested

Reactor vessel shell to bottom head weld.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-2

System/Component for Which Relief is Requested

Reactor Vessel Circumferential Head Welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-A, Item B1.21, requires that the reactor vessel circumferential head welds (Unit 1 bottom head weld number 4-443 and closure head weld number 6-446B; Unit 2 bottom head weld number 4-202 and closure head weld number 6-205B) be volumetrically examined once at or near the end of the interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis as shown in Figure IWB-2500-3, with acceptance standard of IWB-3510.

Code Requirement from Which Relief is Requested

Relief is requested from performing the volumetric examination on these inaccessible welds.

Basis for Relief Request

Design of the reactor vessel circumferential head welds precludes the required examination due to the presence of the bottom head instrument penetrations which prohibit access by the vendor's reactor vessel inspection tool, and the control rod drive mechanism penetrations and cooling duct shroud on the closure head, which prevent access for manual or automated examination.

Proposed Alternative

None.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-2

Justification for Granting of Relief

The head circumferential welds are completely inaccessible for volumetric examination due to the vessel penetrations design. The welds are farthest from the "beltline" region of the shell; therefore, see the least neutron fluence. The bottom head weld area is visually examined as required by Code Category B-N-1 and all welds are subject to visual examination conducted during pressure test per Code Category B-P. These visual examinations and the volumetric examination of all other accessible weld areas on the reactor vessel provide continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals.

This request is essentially the same as a portion of NDE-002 from the first ISI interval and was approved in NRC letter dated December 14, 1988.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-3, R1

System/Component for Which Relief is Requested

Reactor vessel (RV) meridional head welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-A, Item B1.22, requires that the RV meridional head welds (Unit 1 bottom head weld numbers 1-443A through F and closure head welds 1-446A through F; Unit 2 bottom head weld numbers 1-202A through F and closure head weld numbers 1-205A through F) be volumetrically examined once during the interval. Essentially 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis as shown in Figure IWB-2500-3, with acceptance standards of IWB-3510.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination where access is restricted by bottom head instrument penetrations or closure head control rod drive mechanism (CRDM) penetrations, the closure head cooling duct shroud and closure head lifting lugs.

Basis for Relief Request

Design of the RV meridional head welds precludes a portion of the required examinations due to the presence of the bottom head instrument penetrations, which limit the vendor's RV inspection tool to a portion of the examination volume. The CRDM penetrations and cooling duct shroud on the closure head limit access for manual or automated examination to the section of weld below the shroud. The closure head lifting lugs further limit access to three of the welds due to the lugs being attached directly over the welds. Approximately 39 percent of the bottom head welds are accessible approximately 68 percent of the three closure head welds that are not covered by lugs are accessible, and approximately 29 percent of the remaining three closure head welds are accessible for Code volumetric examination. All accessible areas will be examined as required.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-3, R1

Proposed Alternative

All accessible areas (approximately 39 percent of the required volume for the bottom head meridional welds and approximately 68 percent or 29 percent of the required volume for the closure head meridional welds) will be completely examined as required.

Justification for Granting of Relief

Access to portions of these welds is physically limited by permanent RV structure. These portions of the examinations are impractical in accordance with 10 CFR 50.55a(g)(5)(iii). All areas of the bottom head welds accessible to the vendor's examination tool will be completely examined as required. All accessible areas below the closure head cooling duct shroud and not obstructed by the head lifting lugs will be completely examined as required. In addition to the volumetric examination, visual examination of the vessel interior is performed per Code Category B-N-1 and visual examination is conducted during pressure test per Code Category B-P. This partial volumetric examination combined with the visual examinations provide continued assurance of the welds integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The examination of the bottom head welds are expected to be performed during the second half of the intervals. The examinations of the closure head welds are distributed evenly throughout the intervals.

This request is essentially the same as a portion of NDE-002 from the first ISI interval and was approved in NRC letter dated December 14, 1988.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-4

System/Component for Which Relief is Requested

Reactor vessel shell to flange weld.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-A, Item B1.30, requires that the reactor vessel shell to flange weld (Unit 1 weld number 7-442; Unit 2 weld number 7-201) be volumetrically examined once during the interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis as shown in Figure IWB-2500-4, with acceptance standard of IWB-3510.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination where access is restricted due to taper of the shell adjacent to the weld. This restriction affects a portion of the parallel scan from the vessel flange forging.

Basis for Relief Request

Design of the reactor vessel shell to flange weld precludes a portion of the required examination due to the presence of an abrupt taper in the flange forging immediately adjacent to the weld. This taper causes lift-off of the transducer shoe of the vendor's reactor vessel inspection tool during the parallel scan from the vessel surface. All of the weld is accessible for perpendicular scans (done from the flange surface) and approximately 32 percent of the weld is accessible for parallel scans. Overall weld coverage is approximately 66 percent All accessible areas will be examined as required

Proposed Alternative

All accessible areas (approximately 66 percent of the required volume) will be completely examined as required

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-4

Justification for Granting of Relief

The taper adjacent to the weld physically limits access for a portion of the required examination All areas of the shell to flange weld accessible to the vendor's examination tool for the parallel scans will be completely examined as required. Additionally, 100 percent of the required examination from the flange surface is completed using manual scanning techniques. In addition to the volumetric examination, visual examination of the vessel interior is performed per Code Category B-N-1 and visual examination is conducted during pressure test per Code Category B-P. This partial volumetric examination combined with the visual examinations provide continued assurance of the weld integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The parallel scan examination of the shell to flange weld is expected to be performed during the second half of the intervals.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-5

System/Component for Which Relief is Requested

Reactor vessel head to flange weld.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-A, Item B1.40, requires that the reactor vessel head to flange weld (Unit 1 weld number 6-446A; Unit 2 weld number 6-205A) be volumetrically examined once during the interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis, as shown in Figure IWB-2500-5, with acceptance standard of IWB-3510.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination where access is restricted due to the blend radius of the flange and flange bolt holes adjacent to the weld. This restriction affects scans from the flange side. Additionally, the three closure head lifting lugs limit full access from the head side.

Basis for Relief Request

Design of the reactor vessel head to flange weld precludes a portion of the required volumetric examination due to the blend radius of the flange and the flange bolt holes immediately adjacent to the weld. The radius causes lift-off of the transducer shoe and redirection of the sound beam during examination from the flange side, and the holes prevent general access. The three closure head lifting lugs also limit access from the head side. Approximately 68 percent of the weld is accessible. All accessible areas will be examined as required.

Proposed Alternative

All accessible areas (approximately 68 percent of the required volume) will be completely examined as required.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-5

Justification for Granting of Relief

The head to flange blend radius and lifting lugs limit access for a portion of the required examination volume. All accessible areas of the head to flange weld will be completely examined as required In addition to the volumetric examination, a surface examination is performed, and visual examination is conducted during pressure test per Code Category B-P. This partial volumetric examination combined with the surface and visual examinations provides continued assurance of the welds integrity.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI intervals. The examination of the head to flange weld is performed in sections apportioned evenly throughout the intervals.

This request is essentially the same as NDE-003 from the first ISI interval and was approved in NRC letter dated December 14, 1988.

WITHDRAWN 12/11/98

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-6A

System/Component for Which Relief is Requested

Reactor vessel (RV) nozzle to vessel welds.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-6B

System/Component for Which Relief is Requested

Reactor vessel (RV) nozzle to vessel welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-D, item B3.90, requires that the RV nozzle-to-vessel welds (4 each 29 inch nominal pipe diameter outlet nozzles and 27.5 inch nominal pipe diameter inlet nozzles) be volumetrically examined once during the interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from inside the nozzle and from the vessel shell as shown in Figures IWB-2500-7(a), with acceptance standard of IWB-3512.

Code Requirement From Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination from the vessel shell (parallel to the weld) where access is restricted due to the outlet nozzle reinforcement, the adjacent nozzle opening, and the vessel closure flange transition.

Basis for Relief Request

Design of the RV and nozzles precludes a portion of the required examination from the vessel shell side due to the reinforcement on the outlet nozzles which break the plane of the vessel shell, the presence of the adjacent nozzles which limit scan travel, and the closure flange transition which presents a ramp on the scanning surface causing transducer liftoff. Overall, approximately 86 percent of each inlet nozzle weld and 66 percent of each outlet nozzle weld is accessible. All accessible areas will be examined.

Proposed Alternative

All accessible areas, approximately 86 percent of the required volume of inlet nozzles and 66 percent of the required volume for outlet nozzles (in both cases coverage from inside the bore is approximately 100 percent), will be completely examined as required.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-6B

Justification for Granting of Relief

Access to a portion of the examination area is physically limited from the vessel shell side, making examination impractical in accordance with 10 CFR 50.55a (g)(5)(iii). All accessible areas of the nozzle-to-vessel weld will be completely examined, including full coverage from inside the nozzle bore. In addition to the partial volumetric examination, visual examination of the vessel interior is performed per Code Category B-N-1 and visual examination is conducted during pressure test per Code Category B-P. This partial volumetric examination combined with the visual examinations provide continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI intervals. The examinations of the nozzle-to-vessel welds are planned for the second half of the intervals, as described in request #NDE-6A.

This request is essentially the same as NDE-004 from the first ISI interval and was approved in NRC letter dated December 14, 1988.

WITHDRAWN 12/11/98

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-7

System/Component for Which Relief is Requested

Reactor vessel nozzle inside radius section (schedule)

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-8, R1

System/Component for Which Relief is Requested

Pressurizer nozzle inside radius section.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-D, item B3.120, requires that the pressurizer surge line nozzle inside radius section (14 inch nominal pipe diameter) be volumetrically examined once during the interval. Essentially, 100 percent of the nozzle inside radius section is required to be examined as shown in Figure IWB-2500-7(b) for Unit 1, and IWB-2500-7(d) for Unit 2, with acceptance standard of IWB-3512.

Code Requirement From Which Relief is Requested

Relief is requested from performing the volumetric examination of the pressurizer surge line nozzle inside radius section due to inaccessibility on account of the pressurizer heaters and supporting equipment immediately adjacent to and surrounding the nozzle.

Basis for Relief Request

Design of the pressurizer surge line nozzles precludes access to the required examination area. The pressurizer heaters penetrate the bottom head immediately adjacent to the nozzle, prohibiting access for scanning the inner radius section The examination is impractical in accordance with 10 CFR-50.55a(g)(5)(iii) due to the design of the heaters and supporting electrical conduits and connections which prohibit access for examination.

Proposed Alternative

None.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-8, R1

Justification for Granting of Relief

Access for examination is physically limited by the pressurizer heaters and supporting conduit and electrical connections. Assurance of integrity is provided by the Code required pressure test, the performance of inside radius examinations on the top head nozzles, and performance of a limited ultrasonic examination of the Unit 2 surge line nozzle to vessel weld (circumferential scans).

Implementation Schedule

The relief request will be implemented during Units 1 and 2 second ISI intervals.

This request is essentially the same as a portion of NDE-012A in the first inspection interval, and was approved in NRC letter dated December 14, 1988. This new request only applies to the surge line nozzles.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-9

System/Component for Which Relief is Requested

Steam generators (SG) (primary side) nozzle inside radius section.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-D, Item B3.140, requires that the SGs primary side nozzle inside radius section (29 inch nominal pipe diameter inlet nozzle, 31 inch nominal pipe diameter outlet nozzle) be volumetrically examined once during the interval. Essentially, 100 percent of the nozzle inside radius section is required to be examined as shown in Figure IWB-2500-7(d), with acceptance standard IWB-3512.

Code Requirement from Which Relief is Requested

Relief is requested from performing the volumetric examination of the SG nozzles inside radius section.

Basis for Relief Request

Design of the SG and nozzles precludes performance of any meaningful examination of the inside radius section. Compound curvature of the head combined with continuously variable orientation of the nozzle inside radius section and the irregularity of the surface make meaningful examination impossible. Inside the vessel, the nozzle dam rings are installed over the inside radius section, precluding access from that side.

Proposed Alternative

None

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-9

Justification for Granting of Relief

The vessel design and access limitations make meaningful examination of the nozzle inside radius section impossible. Visual examination is conducted during pressure tests per Code Category B-P This visual examination provides continued assurance of integrity.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI intervals.

This request is essentially the same as a portion of NDE-012B from the first ISI interval and was approved in NRC letter dated December 14, 1988.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-10

System/Component for Which Relief is Requested

Reactor vessel NPS 4 or larger nozzle-to-safe end butt welds.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-11

System/Component for Which Relief is Requested

Pressurizer NPS 4 or larger nozzle-to-safe end butt welds.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-11.1R9

System/Component for Which Relief is Requested

Pressurizer (Pzr) NPS 4 or larger nozzle-to-safe end butt welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-F, item B5.40, requires that the Pzr nozzle-to-safe end welds (14 inch nominal diameter surge nozzle line, 6 inch nominal diameter relief nozzles, 4 inch nominal diameter spray nozzle) be examined once during the interval. Essentially, 100 percent of the nozzle-to-safe end weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the Pzr nozzle-to-safe end welds where access is limited by surface configuration.

Basis for Relief Request

Design of the Pzr nozzles and safe ends (316 stainless steel safe end is attached to the nozzles with an inconel weld) limits access for ultrasonic examination due to the nozzle transition radius, weld crown reinforcement and safe end surface bevel geometry adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the nozzles and safe ends would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 1R9 refueling outage, are described below:

Unit 1 Weld	Line	NPS	Limitation	%Accessible
WIB-322 SE	728	6	OD surface contour	67%
WIB-313 SE	729	6	OD surface contour	67%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-11.1R9

Proposed Alternative

All accessible areas of the nozzle-to-safe end welds were completely examined as required, using refracted longitudinal (45 and 60 degree) and 47 degree shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The Pzr nozzle and safe end designs limit full volumetric examination of the nozzle-to-safe end welds due to the nozzle transition radius, weld crown reinforcement, and safe end surface bevels adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category B-P. This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval.

This request is based on examinations conducted during the Unit 1 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-12.1R9

System/Component for Which Relief is Requested

Steam Generator (SG) NPS 4 or larger nozzle-to-safe end butt welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-F, item B5.70, requires that the SG nozzle-to-safe end welds (29 inch nominal diameter inlet nozzle, 31 inch nominal diameter outlet nozzle) be examined once during the interval. Essentially, 100 percent of the nozzle-to-safe end weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the SG nozzle-to-safe end welds where access is limited by surface configuration.

Basis for Relief Request

Design of the SG nozzles and safe ends (stainless steel piping is welded directly to the nozzles) limits access for ultrasonic examination due to abrupt machined bevel geometry adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the nozzles and safe ends would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 1R9 refueling outage, are described below:

Unit 1 Weld	Line	NPS	Limitation	%Accessible
WIB-RC-1-5SE	1	29	OD surface contour	72%
WIB-RC-1-6SE	5	31	OD surface contour	73%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-12.1R9

Proposed Alternative

All accessible areas of the nozzle-to-safe end welds were completely examined as required, using refracted longitudinal (37.5 degree) and 43 degree shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The SG nozzle and safe end designs limit full volumetric examination of the nozzle-to-safe end welds, due to the sharply angled machined surface bevels adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category B-P. This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval.

This request is based on examinations conducted during the Unit 1 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-12.2R8

System/Component for Which Relief is Requested

Steam generator (SG) NPS 4 or larger nozzle-to-safe end butt welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-F, Item B5.70 requires that the SG nozzle-to-safe end welds (29 inch nominal diameter inlet nozzle, 31 inch nominal diameter outlet nozzle) be examined once during the interval. Essentially, 100 percent of the nozzle-to-safe end weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the SG nozzle-to-safe end welds where access is limited by surface configuration.

Basis for Relief Request

Design of the SG nozzles and safe ends (stainless steel piping is welded directly to the nozzles) limits access for ultrasonic examination due to abrupt machined bevel geometry adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the nozzles and safe ends would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 2R8 refueling outage, are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-RC-1-5SE	1	29	OD surface contour	75%
WIB-RC-1-6SE	5	31	OD surface contour	73%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-12.2R8

Proposed Alternative

All accessible areas of the nozzle-to-safe end welds were completely examined as required, using refracted longitudinal wave techniques (45 and 35 degree) with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The SG nozzle and safe end designs limit full volumetric examination of the nozzle-to-safe end welds due to the sharply angled machined surface bevels adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume Surface examination was performed on the entire examination area and visual examination is conducted, as required, by Code Category B-P. This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii)

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 eighth refueling outage

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.1R8

System/Component for Which Relief is Requested

Class 1 pipe welds (nominal pipe size (NPS) 4 or larger).

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, items B9.11 and B9.12, require that circumferential and longitudinal welds in piping systems NPS 4 or larger be examined. Essentially, 100 percent of each scheduled circumferential weld and 12 inches of each adjoining longitudinal weld is required to be examined once during the interval using surface and volumetric methods as shown in Figure IWC-2500-7, with acceptance standard IWC-3514.

Code Requirement From Which Relief is Requested

Relief is requested from performing a portion of the volumetric (or surface, where stated) examination of certain pipe welds as detailed below where access is limited by surface configuration or adjacent structure.

Basis for Relief Request

Design of certain pipe welds limits access for volumetric (or surface) examination due to various geometric conditions on or adjacent to the welds, or due to the presence of physical obstructions such as welded supports, Code nameplates, adjacent piping, structures, or penetrations. These conditions or combination of conditions may restrict scan lengths, cause transducer liftoff, or physically prevent access to portions of the required examination volume. Approximate accessible portions of each weld volume and the specific limitations are described below:

Unit 1 Weld	Line	NPS	Limitation	% Accessible
WIB-RC-1-11.5A	5	31	Abrupt contour chg elbow pp seam	70
WIB-RC-1-11.5B	5	31	Abrupt contour chg elbow pp seam	70
WIB-RC-2-13 5A	6	31	Abrupt contour chg elbow pp seam	70
WIB-RC-2-13 5B	6	31	Abrupt contour chg elbow pp seam	70
WIB-334	727	6	Code ID band welded around pipe	60
WIB-334 surface	727	6	Code ID band welded around pipe	50 surface
WIB-64	13	4	Abrupt contour chg at vlv body	64
WIB-433A	14	4	Abrupt contour chg at vlv body	56

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.1R8

Proposed Alternative

All accessible areas of each weld will be completely examined as required In addition to the partial volumetric examination, the welds receive greater than 90 percent surface examination and visual examination is conducted per Code Category B-P.

Justification for Granting of Relief

The design of the surface configuration or access provisions for the welds listed above limit full volumetric examination, making the requirement impractical in accordance with 10 CFR 50.55a(g)(5)(iii). Volumetric examination will be conducted as required for the accessible portion of the weld volume. Additionally, surface examination is conducted and visual examination is performed during pressure test per Code Category B-P. This partial volumetric examination combined with the surface and visual examination provides continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval. These pipe weld examinations are conducted in the first period of the interval.

This request is similar to NDE-008 from the first ISI interval which was approved in NRC letter dated October 25, 1989. All weld limitations listed in this request have been verified during examinations in the second inspection interval (1R8)

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.1R9

System/Component for Which Relief is Requested

Class 1 systems, circumferential pipe welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, item B9.11, requires that selected circumferential pipe welds, NPS 4 or larger, be examined once during the interval. Essentially, 100 percent of the pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of the pipe welds limits access for ultrasonic examination due to abrupt machined bevel geometry or valve, pump body, or pipe fitting contours adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the pump case, valve body, and pipe fittings would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 1R9 refueling outage, are described below:

Unit 1 Weld	Line	NPS	Limitation	%Accessible
WIB-RC-1-12	5	31	OD surface contour	74%
WIB-RC-2-14	6	31	OD surface contour	62%
WIB-RC-1-13	9	27.5	OD surface contour	75%
WIB-151	254	10	OD surface contour	70%
WIB-210	255	10	OD surface contour	72%
WIB-276	256	10	OD surface contour	81%
WIB-1	235	6	OD surface contour	70%
WIB-171	3845	6	OD surface contour	83%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.1R9

Proposed Alternative

All accessible areas of the circumferential pipe welds were completely examined as required, using combinations of refracted longitudinal and/or shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The pipe weld designs limit full volumetric examination due to the sharply angled machined surface bevels associated with pump casings, valve bodies, or pipe fittings adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category B-P. This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval.

This request is based on examinations conducted during the Unit 1 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.2R8

System/Component for Which Relief is Requested

Class 1 systems, circumferential pipe welds

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, Item B9 11 requires that selected circumferential pipe welds NPS 4 or larger be examined once during the interval. Essentially, 100 percent of the pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of the pipe welds limits access for ultrasonic examination due to abrupt machined bevel geometry or valve, pump body or pipe fitting contours adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff Redesign and modification of the pump case, valve body, and pipe fittings would be required to provide additional access Accessible portions of each weld volume, based on examinations conducted during the 2R8 refueling outage, are described below

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-RC-1-11	5	31	OD surface contour	57%
WIB-RC-2-11	6	31	OD surface contour	57%
WIB-RC-1-12	9	27 5	OD surface contour	52%
WIB-164	254	10	OD surface contour	63%
WIB-106	236	6	OD surface contour	88%
WIB-265	238	6	OD surface contour	88%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.2R8

Proposed Alternative

All accessible areas of the circumferential pipe welds were completely examined as required, using combinations of refracted longitudinal and/or shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The pipe weld designs limit full volumetric examination due to the sharply angled machined surface bevels associated with pump casings, valve bodies or pipe fittings adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category B-P. This partial volumetric exam, combined with the surface and visual examinations, provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50 55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 eighth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.2R9

System/Component for Which Relief is Requested

Class 1 systems, circumferential pipe welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, item B9.21, requires that selected circumferential pipe welds smaller than NPS 4 be examined once during the interval. Essentially, 100 percent of the pipe weld is required to be examined using surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the surface examination of certain pipe welds where access is limited by surface obstructions.

Basis for Relief Request

Design of the pipe welds limits access for surface examination due to Code identification bands or pipe supports welded to the pipe. Redesign and modification of the support or removal of the Code identification plate would be required to provide additional access. Accessible portions of each weld surface, based on examinations conducted during the Unit 2 ninth refueling outage(2R9), are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-408	1171	3	Code ID plate	88%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-13.2R9

Proposed Alternative

All accessible areas of the circumferential pipe welds were completely examined as required, using liquid penetrant examination methods and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The pipe weld designs limit full surface examination due to the welded support or Code ID plate obstructions. Surface examination was performed on the entire accessible examination area and visual examination is conducted as required by Code Category B-P. This partial surface exam combined with the visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted 2R9.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-14.1R9

System/Component for Which Relief is Requested

Class 1 systems, Branch connection pipe welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, item B9.31, requires that selected branch connection pipe welds, NPS 4 or larger, be examined once during the interval. Essentially, 100 percent of the branch connection pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-9, 10, or 11, as applicable, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain branch connection pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of the branch connection pipe welds limits access for ultrasonic examination due to the transition blend radius geometry of the branch connection adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the branch connection pipe fittings would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 1R9 refueling outage, are described below:

Unit 1 Weld	Line	NPS	Limitation	%Accessible
WIB-RC-2-16	254	10	OD surface transition contour	54%
WIB-RC-1-15	13	4	OD surface transition contour	50%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-14.1R9

Proposed Alternative

All accessible areas of the branch connection pipe welds were completely examined as required, using refracted longitudinal and shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The branch connection pipe weld designs limit full volumetric examination due to the transition blend radius associated with the branch connection fittings adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area, and visual examination is conducted as required by Code Category B-P. This partial volumetric exam, combined with the surface and visual examinations, provide continued assurance of the weld's integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval.

This request is based on examinations conducted during the Unit 1 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-14.2R8

System/Component for Which Relief is Requested

Class 1 systems, branch connection pipe welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, Item B9.31 requires that selected branch connection pipe welds NPS 4 or larger be examined once during the interval. Essentially, 100 percent of the branch connection pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWB-2500-9, 10 or 11, as applicable, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain branch connection pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of the branch connection pipe welds limits access for ultrasonic examination due to the transition blend radius geometry of the branch connection adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the branch connection pipe fittings would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 2R8 refueling outage, are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-37	253	10	OD surface transition contour	25%
WIB-55	13	4	OD surface transition contour	32%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-14.2R8

Proposed Alternative

All accessible areas of the branch connection pipe welds were completely examined as required, using refracted longitudinal and shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The branch connection pipe weld designs limit full volumetric examination due to the transition blend radius associated with the branch connection fittings adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category B-P This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 eighth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-15

System/Component for Which Relief is Requested

Class 1 pipe socket welds

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, Item B9 40, requires that socket welds (larger than NPS 1) be examined. Essentially, 100 percent of each scheduled socket weld is required to be examined using surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the surface examination of certain socket welds as detailed below where access is limited by adjacent structure

Basis for Relief Request

Design of certain socket welds limits access for surface examination due to the presence of physical obstructions such as welded supports, Code nameplates, adjacent piping, or structures. These conditions or combination of conditions may physically prevent access to portions of the required examination area. Approximate accessible portions of each weld surface, and the specific limitations are described below

Unit 1 Weld	Line	NPS	Limitation	% Accessible
WIB-302D	1993	1.5	Welded support adjacent	75

Unit 2 Weld	Line	NPS	Limitation	% Accessible
None				

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-15

Proposed Alternative

All accessible areas of each of the welds will be completely examined as required. In addition to the partial surface examination, the welds receive visual examination conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The design of the access provisions for the welds listed above limit full surface examination of the welds. Surface examination will be conducted as required for the accessible portion of the weld. Additionally, visual examination is conducted during pressure test per Code Category B-P. This partial surface examination combined with the visual examinations provides continued assurance of the welds integrity.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI intervals The socket weld examinations are apportioned equally throughout the intervals

This request is essentially the same as a portion of NDE-008 (with supplements) from the first ISI interval and was approved in NRC letter dated October 25, 1989 (typical). Differences in noted coverages may occur due to use of automated scanners which provide a higher quality examination, but may experience somewhat more limited coverage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-15.2R9

System/Component for Which Relief is Requested

Class 1 pipe socket welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, item B9.40 requires that selected socket welds larger than NPS 1 be examined once during the interval. Essentially 100 percent of each scheduled socket weld is required to be examined using surface methods as shown in Figure IWB-2500-8, with acceptance standard IWB-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the surface examination of certain socket welds where access is limited by adjacent structure.

Basis for Relief Request

Design of certain socket welds limits access for surface examination due to the presence of physical obstructions such as welded supports, Code nameplates, adjacent piping, or structures. These conditions or combination of conditions may physically prevent access to portions of the required examination area. Accessible portions of each weld surface, based on examinations conducted during the 2R9 refueling outage, are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-870A	56	2	Pipe flange and bolting	81%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-15.2R9

Proposed Alternative

All accessible areas of the pipe socket welds were completely examined as required, using liquid penetrant examination methods and visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The design of the access provisions for the welds listed above limit full surface examination of the welds. Surface examination was performed on the entire accessible examination area and visual examination is conducted as required by Code Category B-P. This partial surface exam combined with the visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-16

System/Component for Which Relief is Requested

Pumps integrally welded attachments (reactor coolant pumps)

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-K-1, Item B10.20, requires that pumps integrally welded attachments be examined once during the interval Essentially, 100 percent of each scheduled attachment weld (three each on one pump) is required to be examined using surface methods as shown in Figure IWB-2500-15, with acceptance standard IWB-3516.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the surface examination of the reactor coolant pump (RCP) integrally welded attachments where access is limited by adjacent structure.

Basis for Relief Request

Design of the RCP integrally welded attachments limits access for surface examination due to the support base directly under the integrally welded attachment and the pump anchorage design The attachments are U shape members welded around their perimeter that sit directly on the supporting structure. Inside the U, the anchorage is installed immediately adjacent to the weld The supporting structure and anchorages together limit access to approximately 70 percent of the required examination area.

Proposed Alternative

All accessible areas of each of the welds will be completely examined as required In addition to the partial surface examination, the welds and support structure receive visual examination per Code Category F-A.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-16

Justification for Granting of Relief

The design of the RCP integrally welded attachments limit full surface examination of the welds. Surface examination will be conducted as required for the accessible portion of the welds. Additionally, visual examination of the support structure is conducted per Code Category F-A. This partial surface examination combined with the visual examinations provides continued assurance of the welds integrity.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI intervals. The RCP integrally welded attachments examinations are apportioned equally throughout the intervals.

RCP "feet" were previously examined "100 percent as accessible," which is as stated above.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-17, R1

System/Component for Which Relief is Requested

Class 2 vessel shell circumferential welds.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-A, item C1.10, C1.20, and C1.30, require that vessel shell circumferential welds at structural discontinuities on the steam generators (SG), seal injection filters and residual heat removal heat exchangers (RHRHX) be volumetrically examined once during the inspection interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis as shown in Figure IWC-2500-1, with acceptance standard of IWC-3510. For multiple similar vessels, the requirement may be applied to one vessel among the group or distributed among the vessels.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination on the Unit 1 SG and from performing the volumetric examination on the seal injection filters and RHRHX where access is restricted as discussed below for each individual case.

Basis for Relief Request

SG (applies to Unit 1 only): Design of the vessel insulation conformed to the 1974 ASME Code with Summer 1975 Addenda, which required that only 20 percent of each subject weld be examined. As a result, removable insulation windows are only provided to access 20 percent of 1 of the required welds on each vessel (there are 5 required welds total, one of which, the tubesheet to shell weld, is fully accessible. 20 percent of a different 1 of the 4 remaining welds is accessible on each of the 4 vessels). The windows are spaced approximately evenly (120°) around the vessel circumference, except for the top head to shell weld on which windows are spaced adjacent to the personnel access platform which extends around one side of the shell The remaining insulation is not designed to be removable, making the requirement impractical in accordance with 10 CFR 50.55a(g)(5)(iii). Additionally, 10 CFR 50 55a(g)(4) does not require provision of additional access for components which were originally designed in conformance with contemporary Code rules, but which do not meet design and access provisions of subsequently effective editions.

Note: For Unit 2, the insulation was designed to a later Code edition and all welds are accessible as required.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-17, R1

Basis for Relief Request

Seal injection filters: The filters are located in a filter bank with interconnected vaults for shielding. The filters are 61 inches long with 22 inch maximum diameter and the vaults are 63 inches tall by 36 inches on each side. Access to each filter is through a 21-1/2 inch diameter removable hatch on the top of the vault which exposes the filter for cartridge replacement. However, access to the welds from this side is restricted by the filter flange and cover plate assembly and cover plate lifting fixtures. Alternate access is provided by an unshielded crawl space behind the filter bank. This space is obstructed by remote valve operators and instrument cables. Radiation levels are expected to exceed 10 rads per hour in this area. A liquid penetrant examination takes 45 minutes, not counting the time to negotiate the obstructed crawl space. The combination of limited access, high radiation levels, and small size (2 inch diameter) of the lines to/from the filters poses an unjustified hazard to the examination personnel This requirement is therefore impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Note: These filters are isolable by means of manual valves from the "high pressure safety injection system," which is called charging injection at Diablo Canyon Power Plant. If the filters may be classified as separate from the charging injection flowpath on that basis, this portion of the request would not be necessary as the filters would be exempt from examination requirements by Code Case N-408-2.

RHR heat exchanger: These are vertical vessels supported by legs welded to pads which are in turn welded to the vessel shell The legs sit on concrete piers immediately adjacent to the vessel. On the vessel shell, at 90° to each support foot, the nozzle penetrations further limit access to the shell welds. The shell-to-flange weld cannot be scanned from the flange side due to the flange configuration, and the head-to-shell weld is limited from the head side due to curvature of the head. Approximately 10 percent of the shell-to-flange weld and 15 percent of the head-to-shell weld is accessible from the shell side. The accessible portion is further divided into segments of approximately 1/4 of the total each, which is insufficient for any meaningful examination to be performed. Both welds are approximately 80 percent accessible for an alternative surface examination due to the supports. The requirement for volumetric examination and the remaining 20 percent of the surface examination is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-17, R1

Proposed Alternative

SG (applies to Unit 1 only): The accessible 20 percent of each weld will be fully examined as required. Note: Unit 2 welds are fully accessible.

Seal injection filters: None.

RHR heat exchangers: Surface examination of the accessible portion of each weld (approximately 80 percent each, limited by the vessel supports).

Justification for Granting of Relief

Access to portions (or all, in the case of the seal injection filters) of these welds is physically limited. In addition to the proposed alternative examinations detailed above, visual examination is conducted during pressure test per Code Category C-H. On the SG, additional visual examinations are performed from inside the vessel at the upper transition cone weld and the head-to-shell weld as part of the secondary side inspections. The proposed alternative examinations combined with the visual examinations provide continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The alternative examinations of the vessels welds are distributed evenly throughout the intervals.

This request is essentially the same as a portion of NDE-006 (with supplements) from the first ISI interval and was approved in NRC letter dated October 25, 1989. At that time, PG&E committed to volumetrically examine the small portions (less than 15 percent overall, distributed at four positions on the shell) of the RHRHX shell welds that are accessible for volumetric examination. Those examinations were indeed performed; however, PG&E has found the severely limited data obtained to be of no practical value. Therefore, relief is again requested.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-18, R1

System/Component for Which Relief is Requested

Class 2 vessel nozzle welds (without reinforcing plate in vessels >1/2 inch nominal thickness).

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-B, Item C2.21, requires that vessel nozzle welds on the steam generators (SG), residual heat removal (RHR) heat exchangers, and seal injection filters be surface and volumetrically examined once during the interval. Essentially, 100 percent of the weld volume is required to be examined by shear and longitudinal beams from both sides and along the weld axis as shown in Figure IWC-2500-4(a) and (b), or Figure IWC-2500-3(a), with acceptance standard of IWC-3511. For multiple similar vessels, the requirement may be applied to one vessel among the group, or distributed among the vessels

Note: Seal injection filters have NPS2 nozzles and are included here because they are not automatically isolable from the "high pressure safety injection" system (ref. Code Category C-F-1).

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination on the SG feedwater nozzle weld and RHR heat exchanger nozzle welds where access is restricted as discussed below, and from examining the seal injection filter nozzles.

Basis for Relief Request

SG: The feedwater nozzle configuration limits access for scanning from the nozzle side Approximately 70 percent of the required volume is accessible The nozzle weld is not accessible from the nozzle bore due to a welded thermal sleeve (feedring connection) and support structure inside the vessel. The weld is accessible for surface examination.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-18, R1

Basis for Relief Request, cont'd

RHR Heat Exchanger: The nozzle weld configuration limits scans from the nozzle side. From the shell side, the vessel support pads, vessel flange and head-to-shell weld obstruct scans. Approximately 10 percent of each weld is accessible for volumetric examination; however, this amount is insufficient to provide any meaningful examination result. The welds are accessible for surface examination.

Seal Injection Filter: The filters are located in a filter bank with interconnected vaults for shielding. The filters are 61 inches long with 22 inch maximum diameter and the vaults are 63 inches tall by 36 inches on each side. Access to each filter is through a 21-1/2 inch diameter removable hatch on the top of the vault which exposes the filter for cartridge replacement. However, access to the welds from this side is restricted by the filter flange and cover plate assembly and cover plate lifting fixtures. Alternate access is provided by an unshielded crawl space behind the filter bank. This space is obstructed by remote valve operators and instrument cables. Even if ultrasonic examination were possible, it would be extensively limited by the nozzle configuration. Radiation levels are expected to exceed 10 rads per hour in this area. A liquid penetrant examination takes 45 minutes, not counting the time to negotiate the obstructed crawl space. The combination of limited access, high radiation levels, and small size (2" diameter) of the lines to/from the filters poses an unjustified hazard to the examination personnel.

Proposed Alternative

SG: The accessible portion (approximately 70 percent) of the weld will be volumetrically examined as required. Full surface examination.

RHR heat exchanger: Surface examination only, as required.

Seal Injection Filter: None.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-18, R1

Justification for Granting of Relief

Access to portions of these welds is physically limited. In addition to the partial volumetric examination of the feedwater nozzle, all nozzle welds except the seal injection filter receive surface examination as required, and visual examination is conducted during pressure test per Code Category C-H. For the seal injection filter, the VT-2 consists of checking areas where leakage may be channeled. The proposed alternative examinations combined with the visual examinations provide continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The examinations of the Steam Generator and RHR heat exchanger nozzle welds are distributed evenly throughout the intervals.

This request is essentially the same as a portion of NDE-006 and NDE-006A from the first ISI interval and was approved in NRC letters dated October 25, 1989, and September 21, 1992. At that time, PG&E committed to volumetrically examine the small portions (less than 10 percent overall, distributed at four locations) of the RHR heat exchanger nozzle welds that are accessible for volumetric examination. Those examinations were indeed performed; however, PG&E has found the severely limited data obtained to be of no practical value. Therefore, relief is again requested.

For the Seal Injection Filters, this is a new request due to the new Code requirement to examine small diameter pipe in the "high pressure safety injection" system. While these filters are not required for high pressure safety injection per se, the seal injection piping and filters are not automatically isolable from the high pressure safety injection system.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-19, R1

System/Component for Which Relief is Requested

Class 2 vessel nozzle (without reinforcing plate in vessels >1/2 inch nominal thickness) inside radius section.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-B, Item C2.22, requires that vessel nozzle inside radius sections on the residual heat removal (RHR) heat exchangers, and seal injection filters be volumetrically examined once during the interval. Essentially, 100 percent of the nozzle inside radius section is required to be examined as shown in Figure IWC-2500-4(b) for the RHR heat exchanger, with acceptance standard of IWC-3511. There is no Code Figure applicable to the seal injection filters which have NPS2 pipe set into the vessel so there is no inner radius. For multiple similar vessels, the requirement may be applied to one vessel among the group, or distributed among the vessels.

Code Requirement from Which Relief is Requested

Relief is requested from performing the volumetric examination on RHR heat exchanger nozzle inside radius section due to inaccessibility. Relief is requested for the seal injection filter because there is no inner radius due to the configuration of the nozzle (NPS2 pipe set into the vessel shell).

Basis for Relief Request

The RHR nozzle configuration limits scans from the nozzle side and the radial orientation of a postulated flaw is parallel to this scan direction. From the shell side the vessel support pads, vessel flange, head-to-shell weld, and short nozzle weld reinforcement make access for meaningful nozzle inside radius scans impossible.

The seal injection filter does not have an inner radius due to configuration.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-19, R1

Proposed Alternative

None.

Justification for Granting of Relief

Access for scanning the RHR nozzle inside radius sections is physically limited. The adjacent nozzle welds receive a surface examination and visual examination is conducted during pressure test per Code Category C-H. The examinations of the adjacent nozzle areas combined with the visual examinations provide continued assurance of the nozzle inside radius sections integrity.
The seal injection filters have no radius to examine.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The examinations of the adjacent RHR vessel nozzle welds are distributed evenly throughout the intervals. No examination is made on the seal injection filters due to access limitations discussed in request number NDE-18.

This is a new request, based on the 1989 Code requirement.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-20, R1

System/Component for Which Relief is Requested

Class 2 pressure vessels, piping, and pumps integrally welded attachments

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-C, Items C3.10, C3.20, and C3.30, require that integrally welded support attachments to pressure vessels, piping systems, and pumps be examined once during the interval. Essentially, 100 percent of each subject attachment weld is required to be examined using surface methods as shown in Figure IWC-2500-5, with acceptance standard IWC-3512.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the surface examination of certain pressure vessel, piping, or pump support integrally welded attachments as detailed below, where access is limited by surface configuration or adjacent structure.

Basis for Relief Request

Design of certain pressure vessel, piping or pump supports limits access for surface examination due to various geometric conditions on or adjacent to the welds, or due to the presence of physical obstructions such as the welded support, Code nameplates, adjacent piping, or structures. These conditions or combination of conditions may physically prevent access to portions of the required examination area. Approximate accessible portions of each weld area and the specific limitations are described below:

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-20, R1

Unit 1 Weld	Line	NPS	Limitation	% Accessible
Cent'l Charging Pp Legs			Support structure under legs	77

Unit 2 Weld	Line	NPS	Limitation	% Accessible
Cent'l Charging Pp Legs			Support structure under legs	77

Proposed Alternative

All accessible areas of each of the integrally welded attachments will be completely examined as required. In addition to the partial surface examination, the welds receive visual examination conducted per Code Subsection IWF.

Justification for Granting of Relief

The design of the surface configuration or access provisions for the integrally welded attachments listed above, limit full surface examination of the welds. Examination will be conducted as required for the accessible portion of the weld area. Additionally, visual examination is conducted per Code Subsection IWF. This partial surface examination combined with the visual examination provides continued assurance of the welds integrity.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-20, R1

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The integrally welded attachment examinations are apportioned equally throughout the intervals.

The pump and heat exchangers supports were previously examined "100 percent as accessible," which is as stated above.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-21.1R8

System/Component for Which Relief is Requested

Class 2 pipe welds in stainless steel piping.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-F-1, item C5.20, requires that welds in piping systems be examined. Essentially, 100 percent of each scheduled weld is required to be examined once during the interval using surface and volumetric methods as shown in Figure IWC-2500-7, with acceptance standard IWC-3514.

Code Requirement From Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain pipe welds as detailed below where access is limited by surface configuration or adjacent structure.

Basis for Relief Request

Design of certain pipe welds limits access for volumetric examination due to various geometric conditions on or adjacent to the welds, or due to the presence of physical obstructions such as welded supports, Code nameplates, adjacent piping, structures, or penetrations. These conditions or combination of conditions may physically prevent access to portions of the required examination volume. Approximate accessible portions of each weld volume and the specific limitations are described below:

Unit 1 Weld	Line	NPS	Limitation	% Accessible
WIC-189A	111	14	Abrupt surface contours flange-pp	23
WIC-48A	48	3	Abrupt surface contour chg at tee	60

Proposed Alternative

All accessible areas of each weld will be completely examined as required. In addition to the partial volumetric examination, the welds receive greater than 90 percent surface examination and visual examination is conducted per Code Category C-H.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-21.1R8

Justification for Granting of Relief

The design of the surface configuration or access provisions for the welds listed above limit full volumetric examination, making the requirement impractical in accordance with 10 CFR 50.55a(g)(5)(iii). Examination will be conducted as required for the accessible portion of the weld area. Additionally, surface examination is conducted and visual examination is performed during pressure test per Code Category C-H. This partial volumetric examination combined with the surface and visual examination provides continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval. The pipe weld examinations are performed in the first inspection period.

This request is similar to NDE-008 from the first ISI interval which was approved in NRC letter dated October 25, 1989. All welds listed in this request are examined for the first time in the second inspection interval due to the new 1989 Code requirement to examine certain welds in line sizes thinner than 1/2 inch or less than nominal pipe size 4. All weld limitations listed in this request have been verified during examinations in the second inspection interval (1R8).

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-21.1R9

System/Component for Which Relief is Requested

Class 2 pipe welds in stainless steel piping.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-F-1, items C5.10 and C5.20, require that selected welds in piping systems be examined once during the interval. Essentially, 100 percent of each selected pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWC-2500-7, with acceptance standard IWC-3514. NRC has imposed a similar requirement for volumetric examination of certain containment spray system welds.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain circumferential pipe welds where access is limited by surface configuration or adjacent structure.

Basis for Relief Request

Design of certain pipe welds limits access for volumetric examination due to various geometric conditions on or adjacent to the welds such as pipe fitting transition bevels, or due to the presence of physical obstructions such as welded supports; Code nameplates; and adjacent piping, structures, or penetrations. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the pipe welds would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 1R9 refueling outage, are described below:

Unit 1 Weld	Line	NPS	Limitation	%Accessible
WIC-189A	111	14	OD surface contour, flange-pump	47%*
WIC-48A	48	3	OD surface contour, tee	85%*
WIC-54B	54	2	OD surface contour, penetration	87%
WIC-264A	264	8	OD surface contour, elbow	83%
WIC-265A	265	8	OD surface contour, elbow/welded attach	77%

* Accessible percentages revised upward from request #NDE-21.1R8 and includes coverage from scans performed during the 1R8 refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-21.1R9

Proposed Alternative

All accessible areas of each pipe weld were completely examined as required, using combinations of refracted longitudinal and/or shear wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination (except for containment spray system welds) and visual examination is conducted during pressure test per Code Category C-H.

Justification for Granting of Relief

The circumferential pipe welds designs limit full volumetric examination due to pipe fitting transition bevels and welded support attachments adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the welds volume. Surface examination was performed on the entire examination area (except for the containment spray system welds) and visual examination is conducted as required by Code Category C-H. This partial volumetric exam, combined with the surface and visual examinations, provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 1 second ISI interval.

This request is based on examinations conducted during the Unit 1 ninth refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-22

System/Component for Which Relief is Requested

Class 2 pipe welds in carbon or low alloy steel piping

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-F-2, Item C5.51, requires that welds in piping systems be examined. Essentially, 100 percent of each scheduled weld is required to be examined once during the interval using surface and volumetric methods as shown in Figure IWC-2500-7, with acceptance standard IWC-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain pipe welds as detailed below where access is limited by surface configuration or adjacent structure.

Basis for Relief Request

Design of certain pipe welds limits access for volumetric examination due to various geometric conditions on or adjacent to the welds, or due to the presence of physical obstructions such as welded supports, Code nameplates, adjacent piping, structures, or penetrations. These conditions or combination of conditions may physically prevent access to portions of the required examination volume. Approximate accessible portions of each weld volume and the specific limitations are described below:

Unit 1 Weld	Line	NPS	Limitation	% Accessible
None				

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-22

Unit 2 Weld	Line	NPS	Limitation	% Accessible
WIC-1357B	1357	6	Ventilation duct across pipe	75
WIC-1357C	1357	6	Ventilation duct across pipe	80

Proposed Alternative

All accessible areas of each weld will be completely examined as required. In addition to the partial volumetric examination, the welds receive >90 percent surface examination and visual examination is conducted per Code Category C-H.

Justification for Granting of Relief

The design of the surface configuration or access provisions for the welds listed above, limit full volumetric examination. Examination will be conducted as required for the accessible portion of the weld area. Additionally, surface examination is conducted and visual examination is performed during pressure test per Code Category C-H. This partial volumetric examination combined with the surface and visual examination provides continued assurance of weld integrity.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The pipe weld examinations are apportioned equally throughout the intervals.

This request is essentially the same as a portion of NDE-008 (with supplements) from the first ISI interval and was approved in NRC letter dated October 25, 1989 (typical).

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-22.2R8

System/Component for Which Relief is Requested

Class 2 pipe welds in carbon or low alloy steel piping.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-F-2, Item C5.51 requires that selected circumferential welds in piping systems be examined once during the interval. Essentially, 100 percent of each selected pipe weld is required to be examined using volumetric and surface methods as shown in Figure IWC-2500-7, with acceptance standard IWC-3514.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the circumferential pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of certain circumferential pipe welds limits access for ultrasonic examination due to valve body transition bevels and intersecting smaller diameter lines adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the pipe welds would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 2R8 refueling outage, are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WICG-112-1	554	16	OD surface contour	81%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-22.2R8

Proposed Alternative

All accessible areas of the circumferential pipe weld were completely examined as required, using shear wave techniques (45 and 57 degree) with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, the welds received full surface examination and visual examination is conducted during pressure test per Code Category C-H.

Justification for Granting of Relief

The circumferential pipe weld design limits full volumetric examination due to the valve body transition bevel and intersecting smaller diameter lines adjacent to the weld. Volumetric examination was conducted as required for the accessible portion of the weld volume. Surface examination was performed on the entire examination area and visual examination is conducted as required by Code Category C-H. This partial volumetric exam combined with the surface and visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 eighth refueling outage.

NOTE: The original request for relief number NDE-22 remains in effect. This request refers only to examination limitations encountered during the 2R8 refueling outage.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-23

System/Component for Which Relief is Requested

All systems and components, general requirements.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-24

System/Component for Which Relief is Requested

All systems and components, general requirements

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-25

System/Component for Which Relief is Requested

Unit 2 pressurizer surge line nozzle-to-vessel weld

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-D (Program B), Item B3.110, requires that pressurizer nozzle-to-vessel welds be volumetrically examined once during the inspection interval. Essentially 100 percent of the weld is required to be examined as shown in Figure IWB-2500-7(b), with acceptance standard of IWB-3512, using ultrasonic beams oriented normal and parallel to the weld.

Code Requirements from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the pressurizer surge line nozzle-to-vessel weld, using ultrasonic beams directed normal (perpendicular) to the weld. This request applies to Unit 2 only as Unit 1 has a cast nozzle which does not require examination.

Basis for Relief Request

The pressurizer surge line nozzle-to-vessel weld is not accessible for examination from the nozzle side due to the nozzle transition radius immediately adjacent to the weld. From the vessel bottom head side, the weld is obstructed by the heater penetrations which again render it inaccessible for volumetric examination. The weld surface is accessible for circumferential scans (ultrasonic beams oriented parallel to the weld), which will be performed.

Proposed Alternative

The weld surface is accessible for circumferential scans, which will be performed. These scans constitute 50% of the Code required examination.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-25

Justification for Granting of Relief

Design of the pressurizer surge line nozzle-to-vessel weld precludes access for examination with the ultrasonic beam directed normal to the weld due to the nozzle radius and the pressurizer heater penetrations immediately adjacent to the weld. Assurance of continued integrity is provided by the required ultrasonic examination with the beam oriented parallel to the weld, and the visual examination during pressure test per Code Category B-P.

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval, and is the same as a portion of Request for Relief NDE-005, approved for the Unit 2 first interval.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-25.2R8

System/Component for Which Relief is Requested

Pressurizer nozzle-to-vessel welds.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-D (Program B), Item B3.110 requires that the Pressurizer nozzle-to-vessel welds be examined once during the interval. Essentially, 100 percent of the nozzle-to-vessel weld is required to be examined using volumetric methods as shown in Figure IWB-2500-7, with acceptance standard IWB-3512.

Code Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of the Pressurizer nozzle-to-vessel welds where access is limited by surface configuration.

Basis for Relief Request

Design of the Pressurizer nozzles limits access for ultrasonic examination due to compound curvature of the nozzle transition and surface roughness of the pressurizer top head adjacent to the welds. These conditions restrict scan lengths and cause transducer liftoff. Redesign and modification of the nozzles would be required to provide additional access. Accessible portions of each weld volume, based on examinations conducted during the 2R8 refueling outage, are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIB-368(N-V)	729	6	OD surface contour	85%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-25.2R8

Proposed Alternative

All accessible areas of the nozzle-to-vessel welds were completely examined as required, using shear and longitudinal wave techniques with manual scanning methods to assure the most complete coverage possible. In addition to the volumetric examination, visual examination is conducted during pressure test per Code Category B-P.

Justification for Granting of Relief

The Pressurizer nozzle designs limit full volumetric examination of the nozzle-to-vessel welds due to the compound curvature of the nozzle transition and surface roughness of the pressurizer top head adjacent to the welds. Volumetric examination was conducted as required for the accessible portion of the weld volume and visual examination is conducted as required by Code Category B-P. This partial volumetric exam combined with the visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during the Unit 2 eighth refueling outage.

NOTE: The original request for relief number NDE-25 remains in effect. This request refers only to examination limitations encountered during the 2R8 refueling outage.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-26, R1

System/Component for Which Relief is Requested

Unit 2 pressurizer integral attachment weld.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-H, item B8.20, requires the pressurizer support skirt weld to receive surface examination from both sides as shown in Figure IWB-2500-13, with acceptance criteria of IWB-3516.

Code Requirements From Which Relief is Requested

Relief is requested from performing surface examination due to inaccessibility from inside the support skirt, surface examination area C-D as shown on Figure IWB-2500-13. This request does not apply to Unit 1, which has a different support configuration and examination requirement.

Basis for Relief Request

The actual angle of the skirt-to-vessel intersection is even sharper than shown in Code Figure IWB-2500-13, preventing access for the magnetic particle inspection yoke and precluding meaningful examination from inside the support skirt. The pressurizer heater penetrations adjacent to the skirt, with their electrical harness connections and vessel insulation constitute further limitations for access from inside the skirt.

Proposed Alternative

The weld is accessible for volumetric examination, which was the Code requirement in the first inspection interval, and is still the requirement for the Unit 1 weld configuration. Volumetric examination provides an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Justification for Granting of Relief

Design of the vessel support makes access for meaningful surface examination impossible from inside the vessel skirt. The alternative volumetric examination provides equivalent assurance of the continued structural integrity of the weld.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-26, R1

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval. This is a new request due to the Code requirement being changed from the first inspection interval for this weld configuration.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-27

System/Component for Which Relief is Requested

Reactor Vessel Shell-to-Flange Weld; and Threads in Flange.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-28

System/Component for Which Relief is Requested

Seal Injection Filter 1-1 and 2-1 supports.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-29

System/Component for Which Relief is Requested

Unit 2 Class 2 pipe welds.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-F-1 and C-F-2, all Items, require that a number of welds equal to 7.5 percent of all non-exempt welds in Class 2 pipe systems be selected for examination by surface and volumetric methods or by surface methods, once during the inspection interval. Code Footnote 2 discusses distribution of the examinations among the systems. The footnote implies, but does not state, that the distribution is to be made over the multiple streams of the systems.

Code Requirements From Which Relief is Requested

Relief is requested from the implied requirement to distribute the welds selected for examination among all streams of multiple stream systems. This request applies to Unit 2 only. The apportionment of welds in Unit 1 follows a multiple stream distribution.

Proposed Alternative

One hundred percent of the Code required total of Class 2 pipe welds will be examined. The apportionment of Class 2 pipe welds in Unit 2 will be to a single stream in those systems having multiple streams. No other examination requirement will be limited as a result of having the single stream distribution. Should the examination of one stream reveal unacceptable indications, additional examinations will be conducted on another stream in accordance with IWC-2430(a) and (b). All lines are scheduled for periodic pressure test.

Justification for Granting of Relief

The preservice inspection for Unit 2 was based on a single stream concept required in the 1974 Edition of Section XI with Winter 1976 addenda. Although this addenda was not incorporated into the regulation, a relief request for the single stream distribution made during the preservice inspection was approved. This request was duplicated in the first interval ISI Program, and again approved.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-29

Justification for Granting of Relief

All preservice and first interval examinations were distributed using the single stream method. Section XI, paragraph IWC-2420(a) requires that the sequence of component examinations during the first inspection interval shall be repeated during each successive inspection interval, to the extent practical. IWA-1400(h) requires that examination results be compared with the result of previous examinations. These paragraphs would require the continuation of the single stream schedule.

The single stream schedule is not prohibited in Table IWC-2500-1, although it is implied that a multiple stream distribution is intended. All welds on all streams have passed all construction Code acceptance examinations. The preparatory work, including surface conditioning and all prior examinations, has already been completed for the single stream schedule. Each stream of a multiple stream system sees the same service conditions (except the two loops of main steam and feedwater systems having unsheltered exterior sections which are exposed to the atmosphere) as the representative single stream. In the case where there are exterior welds, the "worst case" loop having exterior welds was selected for examination. The total number of welds examined is exactly the same for the single stream or multiple stream distribution. Therefore, the single stream distribution provides at least as representative a selection of welds as the multiple stream method. For these reasons, PG&E believes the proposed alternative offers an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is effectively the same as NDE-012, approved in the Unit 2 first inspection interval and as approved for the Unit 2 preservice inspection.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-30

System/Component for Which Relief is Requested

Steam generator (SG) snubbers attachment clamp.

ASME Section XI Code Requirements

1989 Edition, Table IWF-2500-1, Category F-A, Item F1.10, IWF-2510(b) and Figure IWF-1300-1(d) requires that the snubbers on one SG be VT-3 visually examined once during the inspection interval. IWF-1300(c) and (e) implies, but does not state, that the insulation on the common SG belly band clamp should be removed for the examination.

Code Requirements From Which Relief is Requested

Relief is requested from the implied requirement to remove insulation from the SG at the snubbers' attachment clamp for this examination. The Code language in IWF-1300(e) which appears to indicate insulation is to be removed is quite vague, and it is probable that removal is not the intent. PG&E is concerned that our plans for this examination are clearly understood.

Proposed Alternative

The examination will be completed with the SG insulation left in place. The exposed portions of the clamp attachment will be examined and the insulation will be observed for signs of damage that could indicate loosening of the attachment.

Justification for Granting of Relief

The proposed alternative is the same as the requirement in the 1977 edition with Summer 1978 addenda of Section XI, which was used in the first inspection interval. This examination provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i). Design of the vessel insulation conformed to the 1974 ASME Code with Summer 1975 Addenda (Unit 1), or the 1977 Edition with Summer 1978 Addenda (Unit 2) which did not require the insulation to be removed for these examinations. The vessel insulation is calcium silicate covered with metal sheet which is supported by circumferential bands around the vessel. This material is fragile, crumbles easily, and cannot be reused, so removal would generate substantial radwaste and require replacement of the full vessel insulation at least from the nearest band under the support.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-30

Justification for Granting of Relief

The support band assembly is located on the generator coincident with the elevation of the refueling floor (140') which abuts closely around the generator making access very difficult, especially from below. The very large scope of work including major scaffolding construction that would be required to allow access would result in significant radiation exposure to plant support personnel. For these reasons, the implied requirement is a hardship without compensating benefit to quality and safety in accordance with 10 CFR 50.55a(a)(3)(ii).

Additionally, 10 CFR 50.55a(g)(4) does not require provision of additional access for components which were originally designed in conformance with contemporary Code rules, but which do not meet design and access provisions of subsequently effective editions.

Implementation Schedule

This relief request will be implemented during the Units 1 and 2 second ISI interval.

This is a new request based on the implied 1989 Code requirement. If the definition in IWF-1300(e) is not to be taken as an examination requirement, this request would not be necessary.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-31

System/Component for Which Relief is Requested

Longitudinal Welds in Class 1 and 2 piping systems. Code Case N-524.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-J, items B9.12 and B9.22, require that longitudinal welds in Class 1 piping systems be examined for an axial distance of up to 12 inches at the intersecting circumferential weld. Table IWC-2500-1, Category C-F-1, items C5.12, C5.22, and C5.42; and Category C-F-2, items C5.52, C5.62, and C5.82, require that longitudinal welds in Class 2 piping systems be examined for an axial distance of 2.5T at the intersecting circumferential weld.

Code Requirement from Which Relief is Requested

Relief is requested from performing the longitudinal weld examination to the extent specified in the 1989 Edition Tables.

Basis for Relief Request

Longitudinal welds have not historically been a source of problems in nuclear piping systems. In stainless steel material, longitudinal welds in pipe and fittings are solution annealed to eliminate sensitization which can lead to stress corrosion cracking. The remaining sensitized area of longitudinal welds is the joint with the intersecting circumferential weld, which is the area of focus for Code Case N-524. At Diablo Canyon Power Plant (DCPP) Class 1 longitudinal welds are limited to elbows in the reactor coolant loops. In DCPP, Class 2 systems, high energy pipe is seamless with the exception of certain main steam line fittings, and most other systems seams are limited to fittings. There are some relatively low energy systems that are extensively seam welded. Most of these systems are in radiation areas and the additional time to examine more of the seam welds contributes to higher personnel radiation exposures.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-31

Proposed Alternative

Code Case N-524 has been issued to address extent of examination for longitudinal welds in piping systems. DCPP seam welds will be examined as required by Code Case N-524 when the intersecting circumferential weld is examined. For stainless steel welds, the extent of examination required by Code Case N-524 assures that the areas subject to sensitization will be examined.

Justification for Granting of Relief

Code Case N-524 assures that the required portion of a representative sample of seam welds will be examined. This provides an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i). The additional radiation exposure that would be required to examine more of the seam welds, especially those on the reactor coolant loops, is a burden with no compensating benefit to quality and safety in accordance with 10 CFR 50.55a(a)(3)(ii).

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals.

This is a new request based on the longitudinal weld examination requirements of the 1989 Edition and Code Case N-524.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-33.2R9

System/Component for Which Relief is Requested

Class 2 systems, circumferential pipe welds in containment spray lines.

ASME Section XI Code Requirements

None. NRC requires that selected circumferential pipe welds in the containment spray system (NPS 8, Schedule 10S) be examined once during the interval. Essentially, 100 percent of the pipe weld is required to be examined using volumetric methods, with acceptance standard of IWC-3514.

NRC Requirement from Which Relief is Requested

Relief is requested from performing a portion of the volumetric examination of certain containment spray pipe welds where access is limited by surface configuration.

Basis for Relief Request

Design of the pipe welds limits access for volumetric examination due to the as-welded crown reinforcement surface condition which limit circumferential scans from the weld crown. Grinding the weld crown of these thin wall welds would be required to provide additional access, which could unacceptably reduce the minimum wall thickness. Accessible portions of each weld volume, based on examinations conducted during the Unit 2 ninth refueling outage (2R9), are described below:

Unit 2 Weld	Line	NPS	Limitation	%Accessible
WIC-264A	264	8	Weld crown contour	85%
WIC-264B	264	8	Weld crown contour	85%

INSERVICE INSPECTION (ISI) RELIEF REQUEST #NDE-33.2R9

Proposed Alternative

All accessible areas of the containment spray pipe welds were completely examined as required, using ultrasonic volumetric examination methods and visual examination is conducted during pressure test per Code Category C-H.

Justification for Granting of Relief

The pipe weld designs limit full volumetric examination due to the weld crown reinforcement which limits circumferential scans from the weld surface. Volumetric examination was performed on the entire accessible examination area and visual examination is conducted as required by Code Category C-H. This partial volumetric exam combined with the visual examinations provide continued assurance of the welds integrity. The redesign and modification necessary to provide further access is impractical in accordance with 10 CFR 50.55a(g)(5)(iii).

Implementation Schedule

This relief request will be implemented during the Unit 2 second ISI interval.

This request is based on examinations conducted during 2R9.

ENCLOSURE

INSERVICE INSPECTION RELIEF REQUEST

System/Component for which Relief is Requested

ASME Class 1, 2, and 3 systems.

ASME Section XI (Code) Requirements

The applicable edition of Section XI of the ASME Code for Diablo Canyon Power Plant Unit 1 and Unit 2 first 10-year Inservice Inspection (ISI) interval is the 1977 Edition, with Addenda through Summer 1978. Section XI, paragraph IWA-4400(a), requires that a system hydrostatic test be performed in accordance with IWA-5000 following welded repairs or installation of replacements by welding.

Code Requirement from which Relief is Requested

Relief is requested from performing a system hydrostatic test following weld repairs or installation of replacements by welding.

Basis for Relief Request

Hydrostatic pressure testing of welded repairs are required to meet the Code. As discussed below, PG&E believes that hydrostatic tests impose significant costs, including potentially increased outage duration, while adding marginal (if any) value to the total repair or replacement quality.

Hardships are generally encountered with hydrostatic testing performed in accordance with the Code. For example, since the hydrostatic test pressure would be higher than nominal operating pressure, hydrostatic pressure testing frequently requires significant effort to set up and perform. The need to use special equipment, such as the temporary attachment of test pumps and gages, and the need for individual valve lineups, can cause the testing to be on the outage critical path.

Piping components are designed for a number of loadings that are postulated to occur during the various modes of plant operation. Code hydrostatic testing subjects the piping components to a small increase in pressure over the nominal operating pressure and is not intended to present a significant (potentially destructive) challenge to pressure boundary integrity. Accordingly, hydrostatic pressure testing is primarily regarded as a means to enhance leakage detection during the examination of components under pressure, rather than solely as a measure to determine the structural integrity of the components.

Industry experience has demonstrated that leaks are not discovered as a result of hydrostatic test pressures propagating a pre-existing flaw through a pipe wall. In most cases, leaks are found when the system is at normal operating pressure. At Diablo Canyon, hydrostatic pressure testing is required only upon installation and then once every 10-year inspection interval for Class 1, 3, and portions of the Class 2 boundary, while system leakage tests at nominal operating pressures are conducted a minimum of once each refueling outage for Class 1 systems, and once each 40-month inspection period for Class 3 and the remainder of Class 2 systems. In addition, leaks may be identified during routine system walkdowns by plant operators.

Hydrotests have the added potential to initiate leak paths at mechanical connections (valve packing glands, flange joints), which are acceptable during the test but could continue to leak after return to service.

Proposed Alternative

In lieu of Code-required hydrostatic pressure testing for welded repairs or installation of replacement items by welding in Class 1, 2, and 3 piping systems, PG&E proposes to apply Code Case N-416-1 as alternative rules. Code Case N-416-1 requires that (a) NDE be performed in accordance with the methods and acceptance criteria of the applicable subsection of the 1992 Edition of Section III, (b) a visual examination (VT-2) be performed in conjunction with a system leakage test using the 1992 Edition of Section XI, in accordance with paragraph IWA-5000, at nominal operating pressure and temperature, and (c) the use of this Code Case be documented on an NIS-2 form.

PG&E will comply with the requirements of the Code Case, with the following two proposed exceptions:

- PG&E will perform VT-2 visual examinations (in conjunction with a system leakage test) using the requirements of the 1989 Edition of Section XI, instead of the 1992 Edition specified by Code Case N-416-1. The VT-2 requirements specified in the 1989 Edition are the latest approved by NRC and are effectively identical to those in PG&E's existing VT-2 examination program using the 1977 Edition, with Addenda through Summer 1978. The existing program has proven effective in maintaining leak tight integrity of the pressure boundary. Maintaining a separate VT-2 program using the 1992 Edition is not cost effective. VT-2 requirements differ between the 1989 and 1992 Editions. A comparison of the VT-2 examination requirements in accordance with the 1989 and 1992 Editions is attached.

- Following the performance of welding, the Construction Code requires volumetric examination of repairs or replacements in Class 1 and 2 piping systems exceeding nominal pipe size (NPS) 2; however, for Class 3 components, the Code only requires a surface examination of the final weld pass. Therefore, considering the limited nature of NDE requirements for Class 3 components, PG&E will perform additional surface examinations on the root pass layer of butt and socket welds on

the pressure-retaining boundary of Class 3 components exceeding NPS 2. The surface examination method acceptance criteria will be in accordance with ASME Section III. This additional examination will compensate for the pressure test at normal operating pressure and assure weld quality.

Justification for Granting of Relief

Compliance with the Code hydrostatic testing requirements for welded repairs or replacements of Class 1, 2, and 3 components would result in hardships without a compensating increase in the level of quality and safety. The proposed alternative to use Code Case N-416-1, with the two noted provisions, will provide reasonable assurance that flaws would be discovered.

Implementation Schedule

This relief request will be implemented during the Unit 1 and Unit 2 seventh refueling outages (1R7 and 2R7, respectively), which are the last refueling outages in the first 10-year ISI interval for Units 1 and 2.

ATTACHMENT

COMPARISON OF VT-2 EXAMINATION REQUIREMENTS IN 1992 AND 1989 EDITIONS OF ASME SECTION XI, ARTICLE IWA-2000

Examiner Vision Qualification

- 1992 Edition, IWA-2322 and IWA-2321(a)

  Examiner vision qualification requires near-distance test chart with measured lower case characters. Measurement must be documented and traceable to the chart. VT-2 examiners are required to have 20/30 equivalent distant vision.

- 1989 Edition, IWA-2321

  Examiner vision qualification requires standard Jaeger near-distance test chart. VT-2 examiners are required to have 20/30 equivalent distant vision.

Note: PG&E procedures require VT-2 examiners to have 20/20 equivalent distant vision, based on 1978 Code requirements and the relative importance of distant vision for VT-2 performance.

Examination Distance

- 1992 Edition, IWA-2212(b) and IWA-2210

  Examination distance is required to be maximum of 6 feet from the examination surface. The minimum illumination requirement is 15 foot candles. Battery-powered lighting requires pre- and post-exam calibration at intervals not to exceed 4 hours.

- 1989 Edition, IWA-2212

  Examination distance and illumination levels are established to the satisfaction of the examiner.

Note: PG&E examiner training emphasizes that angle and level of illumination are key factors to examination sensitivity. PG&E does not believe arbitrarily established illumination levels are conducive to quality. The arbitrary requirement for 6 feet maximum distance is adverse to ALARA and may require additional scaffolding and other supports that are not cost effective. The arbitrary requirement for calibration of portable light sources is adverse to

ALARA and provides no demonstrative benefit to examination quality. It would also require maintaining two separate programs for the same type of examinations.

Examiner Certification

- 1992 Edition, IWA-2323

  Level III examiner certification requires basic, method, specific, and practical examinations.

- 1989 Edition, IWA-2322

  Level III examiner certification requires basic, method, and specific examinations.

Note: PG&E has no objection to the requirement for Level III examiners to possess practical ability. All PG&E Level III examiners are fully qualified for and do participate directly in examinations. PG&E's objection to this provision is based on the separate requirement that would necessitate administration of two different programs for Level III VT-2 examiner qualification.

Approval Date: February 15, 1994
See Numeric Index for expiration and any reaffirmation dates.

Case N-416-1
Alternative Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding, Class 1, 2 and 3
Section XI, Division 1

Inquiry: What alternative pressure test may be performed in lieu of the hydrostatic pressure test required by para. IWA-4000 for welded repairs or installation of replacement items by welding?

Reply: It is the opinion of the Committee that in lieu of performing the hydrostatic pressure test required by para. IWA-4000 for welded repairs or installation of replacement items by welding, a system leakage test may be used provided the following requirements are met.

(a) NDE shall be performed in accordance with the methods and acceptance criteria of the applicable Subsection of the 1992 Edition of Section III.

(b) Prior to or immediately upon return to service, a visual examination (VT-2) shall be performed in conjunction with a system leakage test, using the 1992 Edition of Section XI, in accordance with para. IWA-5000, at nominal operating pressure and temperature.

(c) Use of this Case shall be documented on an NIS-2 Form.

If the previous version of this case were used to defer a Class 2 hydrostatic test, the deferred test may be eliminated when the requirements of this revision are met.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1A

System/Component for Which Relief is Requested

Reactor vessel closure flange joint.

Pressure Test Requirement for Which Relief Is Requested

Removal of insulation at bolted connections during VT-2 visual examination.

ASME Section XI Code Requirements

ASME 1989 Edition, Table IWB-2500-1, Category B-P, items B15.10 and B15.11 require a system leakage test (IWB-5221) every refueling outage for those components which have been opened and reclosed (IWA-5211[a]), except that a system hydrostatic test (IWB-5222) is required instead once during the ten year interval. VT-2 visual examination is required in conjunction with these pressure tests. Article IWA-5000, Paragraph IWA-5242, requires that for insulated systems borated for the purpose of controlling reactivity, the insulation shall be removed from pressure retaining bolted connections for VT-2 visual examination.

Code Requirement From Which Relief Is Requested

Relief is requested from removing insulation for performance of VT-2 visual examination on the reactor vessel closure flange joint.

Basis for Relief Request

At the completion of each refueling outage, prior to startup, a system leakage test (or system hydrostatic test) is required per IWB-5221 (or IWB-5222). This test will include the reactor vessel closure flange joint which is normally insulated; therefore, the Code would require the insulation be removed for VT-2 visual examination. This insulation is integrally connected to the control rod drive mechanism (CRDM) fan ducting which is required to heat up and pressurize the primary system. Removing the insulation and the CRDM fan ducting prior to pressurization would preclude being able to pressurize the system to perform the required system leakage test (or system hydrostatic test) and examination.

Basis for Relief Request (continued)

Removing the insulation after pressurization would require depressurizing and cooling the system, removing the ducting and insulation, inspecting, reinstalling the ducting and insulation, and repressurizing. Thus a full thermal cycle of the system would be required. The physical work would have to occur with personnel in approximately a 50 to 80 millirem/hour field.

The reactor vessel is closed by means of dual O-ring seals with an inter-seal leakoff line. This configuration is designed to channel any leakage past the inner O-ring to a telltale transmitter that alarms in the control room, and thence to the reactor cavity sump. Should any leakage past the inner O-ring occur, it would be detected by the Reactor flange leakage monitoring system. The attached Operator Valve Identification Drawing shows this interseal leakoff as a normally open line via valve 8069B, with a temperature indication readout (TI- 401) at Vertical Control Board 2. The normal band on this readout runs to 120°F, and full scale is 300°F. There is also a "Reactor Flange Hi Temp" alarm, PK-1102, which is set to alarm at 120°F. This readout and alarm system ensures that any significant leakage past the inner O-ring at the normal operating pressure/normal operating temperature conditions required during the system leakage test (or system hydrostatic test as required by Code Case N-498-1) would be shown in the control room.

Conversely, in the case of direct VT-2 visual examination with the insulation removed, the leakage would have to pass not only the inner O-ring seal, but the outer one as well before it could be detected. Therefore, the use of the leakage detection system with the insulation left in place provides a superior examination.

Proposed Alternative

The system leakage test (or system hydrostatic test) will be performed with a 4 hour hold time to assure that any leakage will be detectable, but the reactor vessel closure flange joint insulation will not be removed for performance of VT-2 visual examination. Instead, the reactor vessel flange leakage monitoring system will be used to assure that there is no leakage past the inner O-ring seal. VT-2 visual examination will also be conducted around the flange joint from the top of the reactor cavity with the insulation left in place.

Justification for Granting of Relief

Using the reactor vessel flange O-ring leak detection system during the system leakage test or system hydrostatic test with the insulation left in place provides assurance of leak tightness equivalent or superior to direct VT-2 visual examination with the insulation removed. Leakage past the inner O-ring seal only would be detectable by the leak detection system, but leakage would have to pass both the inner and outer O-ring seals to be detectable during direct VT-2 visual examination. Requiring removal of the insulation for direct VT-2 visual examination would also require an unnecessary thermal cycle of the primary system, causing an extreme burden on PG&E with no increase in quality and no commensurate benefit to the health and safety of the public.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The examinations will be performed every refueling outage.

This is a new request based on the 1989 Code requirement.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1B

System/Component For Which Relief Is Requested

Pressurizer relief valve flange joints.

Pressure Test Requirement For Which Relief Is Requested

Removal of insulation at bolted connections of the pressurizer relief valves during VT-2 visual examination.

ASME Section XI Code Requirements

ASME 1989 Edition, Table IWB-2500-1, Category B-P, items B15.10 and B15.11 require a system leakage test (IWB-5221) every refueling outage for those components which have been opened and reclosed (IWA-5211[a]), except that a system hydrostatic test (IWB-5222) is required instead once during the ten year interval. Visual examination VT-2 is required in conjunction with these pressure tests. Article IWA-5000, paragraph IWA-5242, requires that for insulated systems borated for the purpose of controlling reactivity, the insulation shall be removed from pressure retaining bolted connections for VT-2 visual examination.

Code Requirement From Which Relief Is Requested

Relief is requested from removing insulation for performance of VT-2 visual examination on the pressurizer relief valve flange joints.

Basis for Relief Request

At the completion of each refueling outage, prior to startup, a system leakage test (or system hydrostatic test) is required per IWB-5221 (or IWB-5222). This test will include the pressurizer relief valve joints which are normally insulated; therefore, the Code would require the insulation be removed for VT-2 visual examination.

Code Case N-533 modifies the requirement for removal of insulation while pressurized and allows the removal of insulation and inspection of the bolted connections to be conducted after depressurization.

Basis for Relief Request (continued)

The pressurizer relief valves are located at the top of the pressurizer on approximately the 165' elevation. The valves are bolted to the loop seal piping flanges using 1 3/8" diameter SA 564 Type 630 bolting. The environment in this application is not conducive to primary water stress corrosion cracking of this bolting material.

The pressurizer relief valve insulation is critical in maintaining design basis temperature profiles in the pressurizer loop seal as required in NUREG 0737. The loop seal and its associated pressurizer nozzle is designed to provide a water seal under the safety valve seat. Condensate accumulates in this loop as a result of normal heat losses to ambient, forming the water seal in the looped piping. Temperature requirements for the loop seals are based on keeping the water on the loop seal near saturation temperature and at a lower density. This minimizes water hammer and allows most of the water to flash to steam when discharged through the safety valves, thus protecting the downstream piping from extreme stresses. The insulation surrounding the looped piping is designed to maintain the loop seal water temperature above 260°F and valve body temperatures to less than 350°F to meet these temperature requirements. Experience at Diablo Canyon Power Plant (DCPP) has found that establishing the proper temperature profiles requires the precise installation of this insulation.

Removal/replacement of this insulation poses considerable personnel hazards due to the limited accessibility and high operating temperatures. At normal operating temperature and pressure the pressurizer cubicle ambient temperature runs approximately 130°F. This requires personnel to use welder's gloves and protective footwear to avoid melting rubber anti-contamination gloves and boots. Coupled with the narrow ladder access from the 140' elevation, this poses severe risks to personnel hauling insulation up the ladder and working in cumbersome protective apparel in this hot environment to reinstall insulation. Removal and reinstallation of the insulation in these extreme environmental conditions is impractical and would increase the potential for installation errors and personnel injury.

Proposed Alternative

Following return to NOP/NOT, the system leakage test (or system hydrostatic test) on the relief valves will be performed with a 4 hour hold time to assure that any leakage will be detectable without the removal of the insulation. The pressurizer relief valve joint insulation will not be removed for performance of
VT-2 visual examination until the next scheduled maintenance on the relief valves during the following refueling outage, as allowed per Code Case N-533.

Justification for Granting of Relief

The examinations conducted at NOP/NOT after a 4 hour hold time, as mandated by the previous Section XI Code edition used by DCPP, provide adequate assurance of detecting conditions that may be adverse to quality. The use of Code Case N-533 provides a reasonable approach to maintaining a high level of examination sensitivity without the hazards involved with insulation removal and replacement at high temperatures and pressures.

Requiring removal of the insulation for direct VT-2 is impractical and would cause an extreme burden on PG&E with no increase in quality and no commensurate benefit to the health and safety of the public.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The examinations will be performed every refueling outage.

This is a new request based on the 1989 Code requirement.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1C, R1

Pressure Test Requirement for Which Relief is Requested

Removal of insulation at bolted connections in Class 1 systems.

ASME Section XI Code Requirements

1989 Edition, Article IWA-5000, Paragraph IWA-5242, requires that for insulated systems borated for the purpose of controlling reactivity, the insulation shall be removed from pressure retaining bolted connections for Visual Examination VT-2.

Code Requirement from Which Relief is Requested

Relief is requested from removal of insulation at pressure retaining bolted connections in Class 1 systems for Visual Examination VT-2.

Basis for Relief Request

Class 1 system pressure tests are performed in Mode 3 (Hot Standby) at full system pressure and temperature. Removal of insulation under these conditions poses a significant hazard to plant personnel. The additional handling of insulation and support equipment during Mode 3 may also increase the potential for introducing loose material that could be transported to the containment sump during operation.

Code Case N-533 allows Visual Examination VT-2 to be performed as follows for Class 1 systems:

1. A system pressure test and VT-2 visual examination shall be performed each refueling outage without removal of insulation.

2. Each refueling outage the insulation shall be removed from the bolted connection, and a VT-2 visual examination shall be performed. The connection is not required to be pressurized. Any evidence of leakage shall be evaluated in accordance with IWA-5250.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1C, R1

Proposed Alternative

PG&E will implement Code Case N-533 in its entirety for the Class 1 systems. PG&E interprets the insulation removal requirement to require removal in the subsequent refueling outage following the examination.

Justification for Granting of Relief

Pressure tests are conducted at nominal operating pressure in accordance with Code Cases N-498-1 and N-416-1. The mechanical joints in systems are not subjected to excessively high pressures formerly associated with hydrostatic tests, and thus, are not susceptible to leakage initiated from stress to the joint caused by the abnormally high hydrostatic test pressures.

Use of Code Case N-533 eliminates the hazard to personnel associated with removing insulation on systems at 550 degrees F.

The proposed use of Code Case N-533 provides an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals.

This is a new request based on the new 1989 Code requirement.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1E

Pressure Test Requirement for Which Relief is Requested

System pressure test corrective measures.

ASME Section XI Code Requirements

1989 Edition, Article IWA-5000, Paragraph IWA-5250(a)(2), requires that if leakage occurs at a bolted connection during a system pressure test, then all bolting must be removed and a VT-3 visual examination performed to detect corrosion. This requirement is revised in later Code editions to refer to the one bolt nearest the source of leakage.

Code Requirement from Which Relief is Requested

Relief is requested from removal of bolting at leaking connections as a corrective measure for Visual Examination VT-2 of Class 1, 2, and 3 systems.

Basis for Relief Request

Removal of pressure retaining bolting at mechanical connections for Visual Examination VT-3 to detect corrosion in locations where leakage has been identified is not always the most prudent course of action to determine the acceptability of the bolting. The requirement to remove the bolting and look for corrosion does not allow the Owner to consider other factors which may indicate the acceptability of mechanical joint bolting.

Other factors which should be considered when evaluating bolting acceptability, when leakage has been identified at a mechanical joint include but should not be limited to: joint bolting materials, service age of joint bolting materials, location of the leakage, history of leakage at the joint, evidence of corrosion with the joint assembled, and corrosiveness of the process fluid.

Performance of the test while the system is in service may identify leakage at a bolted connection that, upon evaluation, may conclude that the joint's structural integrity and pressure retaining ability is not challenged. It would not be prudent to negatively impact a safety system's availability by removing the system from service to address a leak that does not impact the system's ability to perform its safety function.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1E

Basis for Relief Request cont'd

As an example, bolting is frequently replaced with new material in mechanical joints during plant outages. When the associated system process piping is pressurized during plant startup, leakage may be identified at these joints. The root cause of this leakage is most often due to thermal expansion of the joint and subsequent seepage at the joint gasket. Proper retorquing of the joint bolting, in most cases, stops the leakage. Removal of any bolting to visually examine for corrosion would be unwarranted in this situation due to the new condition of the bolting. ASME Code Interpretation XI-1-92-01 recognizes this situation as one in which the requirements of IWA-5250(a)(2) are not intended to apply.

PG&E believes the following alternative provides an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Proposed Alternative

When leakage is identified at bolted connections by Visual Examination VT-2, during system pressure testing, an evaluation will be performed to determine the susceptibility of the bolting to corrosion and assess the potential for failure. As a minimum, the following six factors will be considered when evaluating the acceptability of the bolting:

1. Bolted materials
2. Corrosiveness of the process fluid
3. Leakage location
4. Leakage history at connection or other system components
5. Visual evidence of corrosion at connection (connection assembled)
6. Service age of bolting materials

When the pressure test is performed with the system in service or required by the Technical Specifications to be operable, and the bolting is susceptible to corrosion, the evaluation shall address the connection's structural integrity until the next component/system outage of sufficient duration. If the evaluation concludes that the system can perform its safety-related function, removal of the bolt closest to the leakage and VT-3 visual examination of the bolt will be performed when the system or component is taken out-of-service for a sufficient duration for accomplishment of other system maintenance activities.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1E

Proposed Alternative cont'd

For bolting that is susceptible to corrosion, and when the initial evaluation indicates that the connection cannot conclusively perform its safety function until the next component/system outage of sufficient duration, the bolt closest to the source of leakage will be removed, receive a VT-3 visual examination, and be evaluated in accordance with IWA-3100(a).

Justification for Granting of Relief

This relief allows a systematic approach and sound engineering judgment for evaluation of bolting in joints exhibiting minor leakage. The use of the outlined evaluation points will provide a thorough basis for the determination of continued use without bolting removal and inspection. Additionally, if the initial evaluation indicates a need for a more in-depth examination, the bolt nearest the source of leakage will be removed, VT-3 examined and evaluated in accordance with IWA-3100(a). This will assure an equivalent level of quality and safety, and the integrity of the joint will be maintained.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals.

This is a new request based on the new 1989 Code requirement.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1F

Pressure Test Requirement for Which Relief is Requested

Hydrostatic test of Class 1, 2, and 3 systems. Code Case N-498-1.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-P; Table IWC-2500-1, Category C-H; and Table IWD-2500-1, Categories D-A, D-B, and D-C require that a system hydrostatic test be performed in accordance with IWA-5000 once each 10-year interval.

Code Requirement from Which Relief is Requested

Relief is requested from performing the hydrostatic test at elevated pressure for Class 3 systems which are not addressed by the currently approved Code Case N-498, pursuant to 10 CFR 50.55a(a)(3)(i).

Basis for Relief Request

Code Case N-498 is generically approved and modifies the requirement for hydrostatic testing (reference Regulatory Guide 1.147, Revision 11, October, 1994) for Code Class 1 and 2 systems.

Code Case N-498-1 extends the application of pressure test at nominal operating pressure to Code Class 3 systems, as well as Class 1 and 2 systems. The elimination of the elevated pressure test requirement is based on the potential to damage system components during hydrostatic tests, the increased safety risk to personnel performing the tests and the fact that Code hydrostatic tests are no more conducive to detection of leaks than tests at nominal operating pressure.

The system hydrostatic test, as stipulated in the 1989 edition of Section XI, is not a test of structural integrity of the system. Industry experience indicates that leaks are not being discovered as a result of hydrostatic test pressures causing a preexisting flaw to propagate through the wall; in most cases leaks are found when the system is at normal operating pressure. Pressure tests for Code Class 3 systems are scheduled once each inspection period. In addition, leaks may be identified during routine system walkdowns by plant operators.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-1F

Basis for Relief Request, continued

Although Section XI hydrostatic testing would not impair the structural integrity of the pressure boundary, it has the potential to initiate leak sites at mechanical connections (valve packing glands, flange joints), which are acceptable during the test but could continue to leak after return to service. Such leaks may have minimal safety significance but may result in additional effort for containment, cleanup and disposal of the leakage. Also the potential for spills, contamination, and longer personnel exposure time in radiation areas are not justified when compared to testing performed at nominal operating conditions.

Proposed Alternative

In lieu of Code-required hydrostatic pressure inspection, PG&E proposes to perform the required visual examination (VT-2) at the same frequency currently required, except that the test would be performed at nominal system pressure in accordance with Code Case N-498-1.

Justification for Granting of Relief

Compliance with Code requirements for hydrostatic pressure testing of Class 3 systems imposes an undue burden with no compensating benefit in quality or safety. Modification of the hydrostatic pressurization requirement has been generically approved for Code Class 1 and 2 systems. The same reasons for approval also apply to Class 3 systems. The primary justification is that leaks are effectively as detectable at nominal system operating pressure as at the somewhat elevated hydrostatic pressure. Testing at nominal system pressure usually eliminates the need to use special pumps and equipment for performance of the test and the need to breach the system, which may contain hazardous or radioactive material.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals.

This request is similar to a request approved for the first ISI interval in an NRC letter dated June 12, 1995.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-2, R1

Pressure Test Requirement for Which Relief is Requested

Class 2 containment penetrations for non-safety related lines.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-H, items C7.30 and C7.40 and Code Cases N-498-1 and N-416-1, requires that piping systems be subject to IWC-5221 and IWC-5222 tests at normal operating pressure once each inspection period, and following repair or replacement, during which Visual Examination VT-2 is conducted.

Code Requirement from Which Relief is Requested

Relief is requested from performing the IWC-5221 and IWC-5222 tests and associated Visual Examination VT-2 for certain lines as described below.

Basis for Relief Request

For non-safety related lines that are classified as Class 2 solely because of the containment isolation function, and that normally operate at a pressure of less than 50 pounds per square inch (psi), the local leak rate test (LLRT) that is performed at 50 psi to meet 10 CFR 50, Appendix J, containment integrity requirements serves to demonstrate the pressure retaining integrity of the line at a higher pressure than Section XI would otherwise require.

Proposed Alternative

The nonsafety related lines detailed below are classified as Class 2 solely for the containment integrity function. The lines all operate at a pressure of less than 50 psi, which is imposed during the LLRT. These lines will be tested under the conditions, acceptance criteria, and at the frequency required for the LLRT, as allowed by Code Case N-522, and after repair or replacement. This provides an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-2, R1

Line		Size (inches)	Normal Pressure (psi)
1163	Pzr Quench Tk Gas Analyzer	3/8	20
2572	SI Pp 1-2 Disch Line RV	1	0
2518	Cnt Spray Pps Disch RV Out PRT	1	3
1459	Chg Pps Suct RV Disch	1	0
2999	SIS RV Outlet Hdr to PRT	4	3
2998	SIS RV Outlet Hdr to PRT	4	3
2061	SI Pps Suct RV Out	1	0
2004	RHR Ht Exchr 2 Out RV	3	0
2003	RHR Ht Exchr 1 Out RV	3	0
3851	SIS Pp 1-1 Disch Line RV	1	0
3852	SIS Pps Recirc Disch Line RV	1	0
525	React Cool Drn Tk Vent	3/4	1.5
526	React Cool Drn Tk Gas Anal	1/2	1.5
4382	CHPS Air Sup Fans 1&2 Disch Pene 83 In	4	3
4386	CHPS Air Sup Fans 1&2 Disch Pene 83 In	4	3
4388	CHPS Air Sup Fans 1&2 Disch Pene 83 In	4	3
4389	CHPS Air Sup Fans 1&2 Disch Pene 83 In	4	3
4387	CHPS Air Sup Fans 1&2 Disch Pene 83 In	4	3
4390	CHPS Exh Air Filt 2 Inlet	4	5
4395	CHPS Exh Air Filt 2 Inlet	4	5
647	Containment Vacuum Relief	12	0
K2-	Containment Purge Out	48	<50
K2-	Containment Purge In	48	<50
3936	Incore Chiller Water Rtn	2	25
3937	Incore Chiller Water Supply	2	25
3837	Containment Air Sample Inlet	1	3
3838	Containment Air Sample Return	1	0
5190	Post-LOCA Samp Cnt Air Rtn	3/8	<50
S-	Post LOCA Samp Cnt Air Sup	3/8	<50
4633	Hyd Mon Cel 82 Cnt Air Sup	3/8	<50
4634	Hyd Mon Cel 82 Cnt Air Ret	3/8	<50
4635	Hyd Mon Cel 83 Cnt Air Sup	3/8	<50
4636	Hyd Mon Cel 83 Cnt Air Ret	3/8	<50
749	Cont Str Sump Pps Disch	2	27
2993	Refueling Canal Water Return	4	7
4663	Post LOCA Sample & R & Cavity Sump	1/4	<50

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-2, R1

Justification for Granting of Relief

The LLRT performed at 50 psi to meet 10 CFR 50, Appendix J, and Code Case N-522, fully demonstrates the pressure retaining integrity of these lines at a pressure exceeding the Section XI test requirement. The LLRT is an instrumented test measuring leakage throughout the entire test boundary including the penetration valves and the pipe segment inside the penetration itself. The VT-2 examination would only check the accessible external surfaces of the pipe (or floors underneath) for evidence of leakage that is visually apparent. The LLRT schedule is similar to that required by Section XI. Performing a set of essentially duplicate tests at a lower pressure, as would be needed to meet the Section XI requirement, imposes a burden that is not compensated by any increase in safety.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The LLRT tests are normally performed at intervals not exceeding 60 months.

This request is essentially identical to Pressure Test Relief 8 in the first ISI interval, approved in NRC letter dated October 25, 1989. This request may be eliminated if Code Case N-522 is approved in Regulatory Guide 1.147.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-3

Pressure Test Requirement for Which Relief is Requested

Eight ASME Code Class 1 closed end drain line segments, 25 ASME Code Class 1 open end tail pipes, and four ASME Code Class 2 open end tail pipes between first and second off manual isolation valves or between first off valve and blind flange or connection.

ASME Section XI Code Requirements

1989 Edition, Table IWB-2500-1, Category B-P, Item B15.51; Table IWC-2500-1, Category C-H, Item C7.40, and Code Case N-498-1, requires that piping systems be subject to IWB-5222 tests or IWC-5222 tests at normal operating pressure once each inspection interval, during which visual examination VT-2 is conducted.

Code Requirement from Which Relief is Requested

Relief is requested from performing the IWB-5222 and IWC-5222 tests for certain line segments as described below.

Basis for Relief Request

These line segments between the manual isolation valves (or between the manual isolation valve and blind flange) serve as open or closed end drains, fill, vent, or test lines. All of the segments are short, the closed end drains less than 18 inches and the open end segments less than 12 inches on average; and small diameter, being 3/4 inch NPS except for two at 1 inch NPS and four at 2 inch NPS. None of the isolation valves are capable of automatic closure. The line segments are not normally pressurized. Line pressure may exist due to first off valve leakby and thermal effects. The Code 10-year pressure test (as required by Code Case N-498-1) is impractical, and relief is requested for the following reasons:

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-3

Basis for Relief Request (continued)

a) Using system pressure to test these line segments would require opening the first off manual valve in Mode 3 (Hot Standby) to pressurize between the two valves or valve and blind flange. However pressure testing in this manner would result in violation of the Class 1 system requirement for double isolation valve protection.

b) For the closed end drains, costly system modifications would be required to break the system and install test connections with open ended isolation valves at each location, with the concurrent unnecessary radiation exposure to personnel, in order to permit pressurization during Mode 6 (Refueling). Testing these closed end drain segments without modification would require defueling the reactor, reclosing and repressurizing the primary system, and extending the outage critical path by approximately ten days. Both these options constitute extreme hardships with no compensating increase in safety.

c) For the open ended line segments, testing in Mode 6 without modification is possible because the lines are provided with test connections and isolation. However, pressurizing each line segment to the nominal reactor coolant system operating pressure would require use of a hydro pump at each of the locations. This would result in unnecessary radiation exposure to plant personnel and increase the risk of contaminated liquid spill. All of these locations are in high radiation areas. Staging the hydro pump, providing access, removing the pipe cap, opening the second off valve, filling and pressurizing the line segment, inspecting, depressurizing and restoring the system, securing the equipment, and disposing of the effluent is estimated by PG&E to require one manrem at each location.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-3

Proposed Alternative

Each line segment below will be visually inspected once during the 10-year system test; however, the line segments will not be pressurized to full system pressure. Pressure may exist due to first off valve leakby and thermal effects. The Class 1 line segments are also observed each refueling outage during the system leakage test and the Class 2 line segments are also observed once each inspection period during the system inservice test.

Note: Line numbers given refer to the main line that the subject segment is joined to. The small segments do not have individual line numbers.

Class	Size	Location	Description
1	3/4	line 2527 betwn vlvs 8364A & 283	RCP Lp 1 Seal Inj Drn RCDT
1	3/4	line 2534 betwn vlvs 8364B & 294	RCP Lp 2 Seal Inj Drn RCDT
1	3/4	line 2536 betwn vlvs 8364C & 303	RCP Lp 3 Seal Inj Drn RCDT
1	3/4	line 2541 betwn vlvs 8364D & 308	RCP Lp 4 Seal Inj Drn RCDT
1	3/4	segment between vlvs 513 & 514	Pzr Spray Drn to RCDT
1	2	segment betwn vlvs 8057A & 8058A	RCP Lp 1 Cld Lg Drn RCDT
1	2	segment betwn vlvs 8057B & 8058B	RCP Lp 2 Cld Lg Drn RCDT
1	2	segment betwn vlvs 8057C & 8058C	RCP Lp 3 Cld Lg Drn RCDT
1	3/4	line 109 betwn vlvs 579 &570	Hot Leg Recirc Vent
1	2	line 961 betw vlvs 8057D & 8066, 8058D	Lp 4 Cld Lg Drn (to 3/4")
1	3/4	RVRLIS connection between valve 8070 & blind flange	
1	3/4	line 14	Loop 2 spray line vent between valve 517 & 518
1	3/4	line 14	Loop 2 spray line drain to RCDT between valve 515 & 516
1	3/4	line 14	Loop 2 spray line drain to RCDT between valve 519 & 520
1	3/4	line 13	Loop 1 spray line vent between valve 521 & 522
1	3/4	line 13	Loop 1 spray line drain between valve 523 & 524
1	3/4	line 1195	Pressurizer PORV vent betwn valve 8056 & blind flange
1	3/4	line 1469	Pzr lp seal vent betwn valve 8052 & 8064A,8064B,8064C
1	3/4	line 1495	RCP 1 seal bypass vent betwn valve 8362A & blind flng
1	3/4	line 1496	RCP 2 seal bypass vent betwn valve 8362B & blind flng
1	3/4	line 1497	RCP 3 seal bypass vent betwn valve 8362C & blind flng
1	3/4	line 1498	RCP 4 seal bypass vent betwn valve 8362D & blind flng

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-3

Proposed Alternative (continued)

Class	Size	Location	Description
1	3/4	U2 In 246	Charging line loop 4 vent between valve 100 & 572
1	3/4	U2 In 253	Accumulator inject loop 1 vent between valve 138 & 139
1	3/4	U2 In 254	Accumulator inject loop 2 vent between valve 140 & 141
1	3/4	U2 In 256	Accumulator inject loop 4 vent between valve 144 & 145
1	3/4	line 235	Safety inject loop 1 hot leg vent between valve 50 & 51
1	3/4	U2 In 236	Safety inject loop 2 hot leg vent between valve 54 & 55
1	3/4	line 237	Safety inject loop 3 hot leg vent between valve 58 & 59
1	3/4	U2 In 238	Safety inject loop 4 hot leg vent between valve 62 & 63
1	3/4	line 109	Hot leg recirc vent between valve 6 & 935
1	3/4	line 109	RHR loop 4 vlv 8702 thermal expn drain betw vlv 3, 4 & 7
2	1	Reactor vessel head vent between valve 8078B & 8078A	
2	1	Reactor vessel head vent between valve 8078C & 8078D	
2	3/4	RVRLIS hot leg instrument connection between valve 617 & 616	
2	3/4	React vessel head vent valve test conn betw test conn & valve 661	

Justification for Granting of Relief

The relief request is justified in accordance with 10 CFR 50.55a(a)(3) because:

a) The proposed alternative provides a reasonable assurance of continued structural integrity. These small, short line segments are normally not pressurized, except for any valve leakby and thermal effects that may cause pressurization. The proposed alternative visual examination will confirm the structural integrity of the line segments. During the 10-year system test, the line segments are expected to remain depressurized. If, however, the line segments pressurize due to valve leakby and thermal effects, the proposed alternate visual examination will essentially be identical to the Code-required VT-2 examination.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-3

Justification for Granting of Relief (continued)

b) Compliance with the Code requirements would result in hardship and unusual difficulties without a compensating increase in the level of quality and safety. For the closed end drain line segments, PG&E would have to either (i) pressurize in Mode 3 (Hot Standby), which would involve an unreviewed safety question by defeating RCS double isolation, resulting in operation in a less conservative manner, (ii) add costly test connections with concurrent increase in potential failure points and unnecessary radiation exposure to plant personnel, or (iii) test with the reactor defueled and reclosed, which would significantly increase outage critical path time to repressurize the reactor and would impose an unnecessary thermal cycle on the system.

   For the open ended line segments, the possibility of testing in Mode 6 exists; however, multiple applications of hydro pumps would be required in high radiation areas with increased personnel exposure and the potential for contaminated liquid spill and increased radwaste generation.

c) The public health and safety is not compromised by this relief because the alternative visual examination provides an acceptable level of quality and safety.

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The alternate visual examination is scheduled at or near the end of the interval, coincident with the 10-year system pressure test.

This request is essentially identical to pressure test reliefs 10, 11A, 11B and 12 in the first ISI interval, approved in NRC letter dated September 21, 1992. Certain vent or drain lines have subsequently been removed and capped, and are not included in this request.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-4, R1

Pressure Test Requirement for Which Relief is Requested

Fuel transfer tube to refueling canal.

ASME Section XI Code Requirements

1989 Edition, Table IWC-2500-1, Category C-H, item C7.30, and Code Case N-498-1 requires that the system be pressurized to normal operating pressure for the periodic system functional tests and the 10 year system test during which the Visual Examination VT-2 is conducted.

Code Requirement From Which Relief is Requested

Relief is requested from pressurization and performance of the Visual Examination VT-2.

Basis for Relief Request

The fuel transfer tube is not safety-related except for the containment isolation function, and it is not in service except in Mode 6 (Refueling). It is normally isolated by a flange cover which is the containment isolation point. Most of the tube is inside the containment penetration and inaccessible for examination.

Proposed Alternative

The flange O-ring seal will be inspected for integrity under the program being developed to comply with Section XI, Subsection IWE. The penetration is also part of Class MC that is tested under 10 CFR 50, Appendix J. Code Case N-522 allows the 10 CFR 50, Appendix J test to be credited as the Code examination.

INSERVICE INSPECTION (ISI) RELIEF REQUEST #PRS-4, R1

Justification for Granting of Relief

The flange cover and seal are the containment isolation points. Inspection of these components will assure leak tight integrity. Since the penetration is flanged off during Modes 1 through 5, performance of the Code examination with the tube flooded would not serve to provide any assurance of the integrity of the penetration. The penetration will also be examined in accordance with Code Case N-522. The proposed alternative offers an equivalent level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(ii).

Implementation Schedule

This relief request will be implemented during Units 1 and 2 second ISI intervals. The alternative examination will be conducted at the frequency required by 10 CFR 50, Appendix J.

This request is essentially identical to Pressure Test Relief 9 in the first ISI interval, approved in NRC letter dated October 25, 1989. Approval of Code Case N-522 in Regulatory Guide 1.147 will eliminate the need for this request.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #CNT-1

System/Component for Which Relief is Requested

Containment structure, including concrete shell and metal liner.

WITHDRAWN

INSERVICE INSPECTION (ISI) RELIEF REQUEST #DOC-1

Requirement for Which Relief is Requested

ISI summary report licensing submittals.

RIISI

November 8, 2001

Mr. Gregory M. Rueger
Senior Vice President, Generation and
Chief Nuclear Officer
Pacific Gas and Electric Company
Diablo Canyon Nuclear Power Plant
P. O. Box 3
Avila Beach, CA 94177

SUBJECT: DIABLO CANYON NUCLEAR POWER PLANT, UNITS NO. 1 AND 2 (DCPP) - APPROVAL OF RELIEF REQUEST FOR APPLICATION OF RISK-INFORMED INSERVICE INSPECTION PROGRAM FOR AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE CLASS 1 AND 2 PIPING (TAC NOS. MB1203 AND MB1204)

Dear Mr. Rueger:

By letter dated February 16, 2001 (DCL-01-015), you requested approval of an alternative risk-informed inservice inspection (RI-ISI) program for American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1 and 2 piping welds for DCPP, Units 1 and 2. The letter included an enclosure describing the proposed program. Additional information was provided in your letter dated August 24, 2001 (DCL-01-084), which was in response to our request for additional information dated July 25, 2001.

The RI-ISI program for DCPP was developed in accordance with Electric Power Research Institute Topical Report TR-112657, Revision B-A, using the Nuclear Energy Institute template methodology. Based on the enclosed safety evaluation, we conclude that the proposed RI-ISI program is an acceptable alternative to the requirements of Section XI of the ASME Code for inservice inspection. Therefore, your request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety. The relief is authorized for the second 10-year ISI interval for DCPP Units 1 and 2.

Sincerely,

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-275
and 50-323

Enclosure: Safety Evaluation

cc w/encl: See next page

November 8, 2001

Mr. Gregory M. Rueger
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Chief Nuclear Officer
Pacific Gas and Electric Company
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P. O. Box 3
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Sincerely, */RA/*

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-275
and 50-323

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RISK-INFORMED INSERVICE INSPECTION PROGRAM

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-275 AND 50-323

1.0 INTRODUCTION

By application dated February 16, 2001 (Reference 1), Pacific Gas and Electric Company (the licensee) proposed a risk-informed inservice inspection (RI-ISI) program as an alternative to a portion of their current inservice inspection (ISI) program for Diablo Canyon Nuclear Power Plant, Units 1 and 2 (DCPP). The scope of the RI-ISI program is limited to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code) Class 1 and 2 piping (Categories B-F, B-J, C-F-1, and C-F-2 welds) only. Additional information was provided in a letter from the licensee dated August 24, 2001 (Reference 2). The licensee's letter dated August 24, 2001, was in response to the staff's request for additional information dated July 25, 2001.

The licensee's RI-ISI program was developed in accordance with the methodology contained in the Electric Power Research Institute (EPRI) Topical Report (TR) EPRI TR-112657, Revision B-A (Reference 3), which was previously reviewed and approved by the staff. Reference 3 contains the letter issued by the staff on October 28, 1999, that approved the TR. DCPP Units 1 and 2, are currently in their second 10-year ISI interval. The RI-ISI program proposed by the licensee is an alternative pursuant to 10 CFR 50.55a(a)(3)(i).

2.0 BACKGROUND

2.1 Applicable Requirements

Pursuant to 10 CFR 50.55a(g), the ISI of the ASME Code Class 1, 2, and 3 components must be performed in accordance with Section XI of the ASME Code, "Rules for Inservice Inspection of Nuclear Power Plant Components," and applicable addenda, except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). The regulation, 10 CFR 50.55a(a)(3), states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements set forth in the ASME Code, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components conducted during the first 10-year interval and

subsequent intervals comply with the requirements in the latest edition and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

DCPP Unit 1 began its second 10-year interval on January 1, 1996, and Unit 2 began its second 10-year interval on June 1, 1996. The applicable edition of the ASME Code, Section XI for both units is the 1989 edition, no addenda.

2.2 Summary of Proposed Approach

The licensee has proposed to use a RI-ISI program for ASME Code Class 1 and 2 piping (Examination Categories B-F, B-J, C-F-1, and C-F-2 welds), as an alternative to the ASME Code, Section XI requirements. The ASME Code requires in part that for each successive 10-year ISI interval, 100 percent of Category B-F welds and 25 percent of Category B-J welds for the ASME Code Class 1 non-exempt piping be selected for volumetric and/or surface examination, based on existing stress analyses and cumulative usage factors. For Category C-F welds, 7.5 percent of non-exempt welds are selected for volumetric and/or surface examination. The application follows the staff-approved RI-ISI process and methodology delineated in Reference 3.

The number of inspection locations is significantly reduced by assessing piping failure potential and piping failure consequences, and performing probabilistic risk assessment (PRA) and safety significance ranking of piping segments. However, the RI-ISI program retains the fundamental requirements of the ASME Code, such as inspection methods, acceptance guidelines, pressure testing, corrective measures, documentation requirements and quality control requirements. Thus, ISI program requirements of other non-related portions of the ASME Code, Section XI are unaffected.

The licensee stated that the augmented ISI program for flow accelerated corrosion (FAC) implemented in response to NRC Bulletin 89-08, "Erosion/Corrosion - Induced Pipe Wall Thinning," is not changed by the RI-ISI program. The licensee also indicated that it committed to performing volumetric examinations on a percentage of the welds in portions of the containment spray, chemical and volume control, system injection, and residual heat removal systems piping that is less than 0.375 inch thick during each ten-year interval. This piping is included in the scope of the RI-ISI application and is thus subsumed by the program. Other remaining augmented ISI programs are either unaffected or modified in accordance with the guidance of Reference 3.

According to the information provided in Reference 1, DCPP Unit 1 is currently in the second 10-year interval that started on January 1, 1996, and Unit 2 is currently in the second 10-year interval that started on June 1, 1996. Unit 1 is currently at the start of the second period of its second inspection interval. The licensee stated that 33.6 percent of the examinations required by ASME Section XI have been completed. The licensee further stated that 66.4 percent of the RI-ISI examinations will be performed during the second and third periods so that 100 percent of the selected examinations are performed during the interval. Unit 2 is currently at the start of the second period of its second inspection interval. The licensee stated that 32.7 percent of the examinations required by ASME Section XI have been completed. The licensee further stated that 67.3 percent of the RI-ISI examinations will be performed during the second and third

periods so that 100 percent of the selected examinations are performed during the interval. In response to a staff question (Reference 2), the licensee stated that the remaining 66.4 percent for Unit 1 and 67.3 percent for Unit 2 RI-ISI examinations will be based on risk categorization and that the more risk significant welds will be inspected first.

The implementation of an RI-ISI program for piping should be initiated at the start of a plant's 10-year ISI interval consistent with the requirements of the ASME Code and Addenda committed to by the licensee in accordance with 10 CFR 50.55a. However, the implementation may begin at any point in an existing interval, as long as the examinations are scheduled and distributed consistent with the ASME Code requirements (e.g., the minimum examinations completed at the end of the three inspection periods under ASME Code Program B should be 16 percent, 50 percent, and 100 percent, respectively, and the maximum examinations credited at the end of the respective periods should be 34 percent, 67 percent, and 100 percent, respectively). In Reference 1, the licensee stated that the ASME Code minimum and maximum inspection requirements will be met.

It is also the staff's view that the inspections for the RI-ISI program and for the balance of the ISI program should be on the same interval start and end dates. This can be accomplished by either implementing the RI-ISI program at the beginning of the interval, or merging the RI-ISI program into the ISI program for the balance of the inspections if the RI-ISI program is to begin during an existing ISI interval. One reason for this view is that it eliminates the problem of having different ASME Codes of record for the RI-ISI program and for the balance of the ISI program. A potential problem with using two different interval start dates, and hence two different ASME Codes of record, would be having two sets of repair/replacement rules depending upon which program identified the need for repair (e.g., a weld inspection versus a pressure test). According to the information provided in Reference 1, the licensee will merge the RI-ISI program into the existing ISI program so that the 10-year interval start and end dates will not be impacted.

3.0 EVALUATION

Pursuant to 10 CFR 50.55a(a)(3)(i), the staff has reviewed and evaluated the licensee's proposed RI-ISI program, including those portions related to the applicable methodology and processes contained in Reference 3, based on guidance and acceptance criteria provided in Regulatory Guides (RGs) 1.174 (Reference 4) and 1.178 (Reference 5), and in Standard Review Plan Chapter 3.9.8 (Reference 6).

3.1 Proposed Changes to the ISI Program

The scope of the licensee's proposed RI-ISI program is limited to ASME Code Class 1 and Class 2 piping welds for the following examination categories: B-F for pressure retaining dissimilar metal welds in vessel nozzles, B-J for pressure retaining welds in piping, C-F-1 for pressure retaining welds in austenitic stainless steel or high alloy piping, and C-F-2 for pressure retaining welds in carbon or low alloy steel piping. The RI-ISI program is proposed as an alternative to the existing ISI requirements of the ASME Code, Section XI. A general description of the proposed changes to the ISI program is provided in Sections 3 and 5 of Attachment 1 to Reference 1.

During the course of its review, the staff verified that the proposed RI-ISI program is consistent with the guidelines contained in Reference 3, which states that industry and plant-specific piping failure information, if any, is to be utilized to identify piping degradation mechanisms and failure modes, and consequence evaluations are to be performed using PRAs to establish piping segment safety ranking for determining new inspection locations. Thus, the staff concludes that the licensee's application of the Reference 3 approach is an acceptable alternative to the current DCPP Units 1 and 2, piping ISI requirements with regards to the number, locations, and methods of inspections, and provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(a)(3)(i).

3.2 Engineering Analysis

In accordance with the guidance provided in References 4 and 5, an engineering analysis of the proposed changes is required using a combination of traditional engineering analyses and supporting insights from the PRA. The licensee elaborated as to how the engineering analyses conducted for the DCPP Units1 and 2, RI-ISI program ensure that the proposed changes are consistent with the principles of defense-in-depth and that adequate safety margins will be maintained. This is accomplished by evaluating a location's susceptibility to a particular degradation mechanism and then performing an independent assessment of the consequence of a failure at that location.

The licensee's RI-ISI program at DCPP Units 1 and 2, is limited to ASME Code Class 1 and 2 piping welds. The licensee stated in Reference 1 that other non-related portions of the ASME Code will be unaffected by this program. Piping systems defined by the scope of the RI-ISI program were divided into piping segments. Pipe segments are defined as lengths of pipe whose failure leads to similar consequences and are exposed to the same degradation mechanisms. That is, some lengths of pipe whose failure would lead to the same consequences may be split into two or more segments when two or more regions are exposed to different degradation mechanisms.

In Reference 1, the licensee stated that failure potential categories were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in Reference 3. The degradation mechanisms identified in the submittal include thermal fatigue, including thermal stratification, cycling and striping (TASCS), and thermal transients; intergrannular stress corrosion cracking (IGSCC); and FAC. The licensee stated in Section 2.2 of Attachment 1 to Reference 1, that the augmented inspection program for FAC is relied upon to manage this mechanism, and is not changed by the RI-ISI program. In Reference 2, the licensee committed to volumetric examinations of portions of containment spray, chemical and volume control, safety injection, and residual heat removal systems piping less than 0.375 inch thick even though ASME Code Section XI does not require surface or volumetric examinations on this piping. Section 2.2 states that this piping was included in the scope of the RI-ISI application. In response to the staff question (Reference 2), the licensee stated that this commitment will be revised in accordance with the DCPP commitment change process to state that, in lieu of selecting 7.5 percent of the thin wall (less than 0.375 inch) in portions of containment spray, chemical and volume control, safety injection, and residual heat removal systems piping, the selection of welds will be based on the methodology in Reference 3. The staff finds that this selection of welds, based on the RI-ISI methodology, to

be acceptable because the inspections are focused on locations with potential for flaws and with higher failure consequences under the RI-ISI program.

In Section 3 of Attachment 1 to Reference 1, the licensee described a deviation to the EPRI RI-ISI methodology for assessing the potential for TASCS that was implemented by the licensee. In Reference 2, the licensee stated that the methodology for assessing TASCS in the DCPP RI-ISI submittal is identical to the Materials Reliability Project (MRP) methodology in EPRI TR-1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001. The staff has reviewed the guidance for evaluating TASCS in EPRI TR-1000701 and finds it to be acceptable. The licensee further stated that it will update the RI-ISI program based on the final EPRI MRP guidance if warranted.

3.3 Probabilistic Risk Assessment

As stated in Reference 1, the licensee used PRA model DCPRA-00, stage 1, updated from their original 1988 Diablo Canyon Probabilistic Risk Assessment (DCPRA-1988) to evaluate the consequences of pipe rupture for the RI-ISI assessment. The DCPRA-1991 model was submitted as the DCPP Individual Plant Examination (IPE) in April 14, 1992, with additional information submitted in January 15, 1993. The IPE identified a core damage frequency (CDF) of 9.5E-5/year and a large early release frequency (LERF) of 1.1E-6/year. The staff evaluation report (SER), dated June 30, 1993, concluded that the DCPP IPE satisfied the intent of Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities." Additionally, the staff's SER did not report any significant weaknesses found in the review of DCPP IPE. The licensee stated in Reference 1, that in the DCPRA-00 PRA model, initiating event frequencies were updated using NUREG/CR-5750 data and common cause failure parameters were updated using NUREG/CR-6268 data. The DCPRA-00 PRA model estimates a CDF of 5.05E-6/year and a LERF of 1.81E-6/year. The DCPRA-00 PRA model, stage 1, was evaluated by the Westinghouse Owners Group (WOG) peer review process. The licensee determined that the quality issues identified by the WOG peer review process do not substantially impact the risk ranking of the segments in the RI-ISI assessment. The submittal further stated that the enhancements recommended by the WOG peer review process are being implemented in the current revision of the model, DCPRA-00, stage 2.

The staff did not review the IPE analysis to assess the accuracy of the quantitative estimates. The staff recognizes that the quantitative results of the IPE are used as order of magnitude estimates for several risk and reliability parameters used to support the assignment of segments into three broad consequence categories. Inaccuracies in the models or in assumptions large enough to invalidate the broad categorizations developed to support RI-ISI should have been identified during the staff's review of the IPE and by the licensee's model update control program. Minor errors or inappropriate assumptions will affect only the consequence categorization of a few segments and will not invalidate the general results or conclusions. The staff finds the quality of the licensee's PRA sufficient to support the proposed RI-ISI program.

The degradation category and the consequence category were combined according to the approved methodology described in Reference 3 to categorize the risk significance of each segment. The risk significance of each segment is used to determine the number of weld inspections required in each segment.

As required by Section 3.7 of Reference 3, the licensee evaluated the change in risk expected from replacing the current ISI program with the RI-ISI program. The calculations estimated the change in risk due to removing locations and adding locations to the inspection program. The expected change in risk was quantitatively evaluated using the "Simplified Risk Quantification Method" described in Section 3.7.2 of Reference 3. For high consequence category segments, the licensee used the conditional core damage probability (CCDP) and conditional large early release probability (CLERP) based on the highest estimated CCDP and CLERP. For medium consequence category segments, bounding estimates of CCDP and CLERP were used. The licensee estimated the change in risk using bounding pipe failure rates from the EPRI methodology.

The licensee performed their bounding analysis with and without taking credit for an increased probability of detection (POD). In Reference 1, for Unit 1 the licensee estimated the aggregate change in CDF to be about -1.76E-8/year and estimated the aggregate change in LERF to be about -1.69E-9/year excluding credit for any increased POD due to the use of improved inspection techniques. Including the expected increased POD results in an aggregate estimated change in CDF of -4.84E-8/year and aggregate estimated change in LERF of -4.64E-9/year for Unit 1. For Unit 2, the licensee estimated the aggregate change in CDF to be about -2.29E-8/year and estimated the aggregate change in LERF to be about -2.2E-9/year excluding credit for any increased POD due to the use of improved inspection techniques. Including the expected increased POD results in an aggregate estimated change in CDF of -5.97E-8/year and aggregate estimated change in LERF of -5.72E-9/year for Unit 2.

The staff finds that the licensee's process to evaluate and bound the potential change in risk is reasonable because it accounts for the change in the number and location of elements inspected, recognizes the difference in degradation mechanism related to failure likelihood, and considers the effects of enhanced inspection. System level and aggregate estimates of the changes in CDF and LERF are less than the corresponding guideline values in Reference 3. The staff finds that re-distributing the welds to be inspected with consideration of the safety-significance of the segments, provides assurance that segments whose failures have a significant impact on plant risk receive an acceptable and often improved level of inspection. Therefore, the staff concludes that the implementation of the RI-ISI program as described in the licensee's application will have a small impact on risk consistent with the guidelines of Reference 4.

3.4 Integrated Decisionmaking

As described in Reference 1, an integrated approach is utilized in defining the proposed RI-ISI program by considering, in concert, the traditional engineering analysis, risk evaluation, and the implementation and performance monitoring of piping under the program. This is consistent with the guidelines of Reference 5.

The selection of pipe segments to be inspected using the results of the risk category rankings and other operational considerations is described in Section 3.5 of Attachment 1 of Reference 1. Tables 3.5-1 and 3.5-2 provide the number of locations and inspections by risk category for the various systems in DCPP Units 1 and 2, respectively. Table 5-2-1 in Attachment 1 to Reference 1 compares the number of inspections required under the existing ASME Code, Section XI ISI program with the alternative RI-ISI program for Unit 1 and

Table 5-2-2 provides the same information for Unit 2. The risk impact analysis results for each system for Units 1 and 2 are provided in Tables 3.6-1 and Table 3.6-2, respectively. The licensee used the methodology described in Reference 3 to guide the selection of examination elements within high and medium risk-ranked piping segments. The methodology described in Reference 3 requires that existing augmented programs, other than thermal fatigue and IGSCC Category A piping welds, which the RI-ISI program subsumes, be maintained. Reference 3 describes targeted examination volumes (typically associated with welds) and methods of examination based on the type(s) of degradation expected. The staff has reviewed these guidelines and has determined that, if implemented as described, the RI-ISI examinations should result in improved detection of service-related degradations over those currently required by ASME Code, Section XI.

The staff finds that the location selection process is acceptable since it is consistent with the process approved for Reference 3, takes into account defense-in-depth, and includes coverage of systems subjected to degradation mechanisms in addition to those covered by augmented inspection programs.

The objective of the ISI required by ASME Code, Section XI is to identify conditions (i.e., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. Therefore, the RI-ISI program should meet this objective if found to be acceptable for use. Further, since the risk-informed program is based on inspection for cause, element selection should target specific degradation mechanisms. The inspection for cause approach involves identification of specific damage mechanisms that are likely to be operative, the location where they may be operative, and appropriate examination methods and volumes specific to address the damage mechanisms.

Chapter 4 of Reference 3 provides guidelines for the areas and/or volumes to be inspected, as well as the examination method, acceptance standard, and evaluation standard for each degradation mechanism. Based on review of the cited portion of Reference 3, the staff concludes that the examination methods for the proposed RI-ISI program are appropriate since they are selected based on specific degradation mechanisms, pipe sizes, and materials of concern.

3.5 Implementation and Monitoring

Implementation and performance monitoring strategies require careful consideration by the licensee and are addressed in Element 3 of References 5 and 6. The objective of Element 3 is to assess the performance of the affected piping systems under the proposed RI-ISI program by implementing monitoring strategies that confirm the assumptions and analyses used in the development of the RI-ISI program. To approve an alternative pursuant to 10 CFR 50.55a(a)(3)(i), the staff must conclude that implementation of the RI-ISI program, including inspection scope, examination methods, and methods of evaluation of examination results, must provide an adequate level of quality and safety.

The licensee stated that, upon approval of the RI-ISI program, procedures that comply with the guidelines in Reference 3 will be prepared to implement and monitor the RI-ISI program. The licensee confirmed that the applicable portions of the ASME Code, such as inspection methods,

acceptance guidelines, pressure testing, corrective measures, documentation requirements, and quality control requirements would be retained.

The licensee stated in Section 4 of Attachment 4 to Reference 1 that the RI-ISI program is a living program and its implementation will require feedback of new, relevant information to ensure the appropriate identification of safety significant piping locations. The submittal also states that, as a minimum, risk ranking of piping segments will be reviewed and adjusted on an ASME Code period basis, and that significant changes may require more frequent adjustment as directed by NRC bulletin or generic letter requirements, or by industry and plant-specific feedback.

In response to the staff's request for further clarification, the licensee stated in Reference 2 that the ISI program will be updated and submitted to the NRC consistent with regulatory requirements in effect at the time such update is required (currently every 10 years). The licensee stated that this may again take the form of a relief request to implement an updated RI-ISI program depending on future regulatory requirements. Reference 2 also stated that the RI-ISI program will be resubmitted to the NRC prior to the end of any 10-year ISI interval if there is some deviation from the RI-ISI methodology described in Reference 1, or if industry experience determines that there is a need for significant revision to the program as described in Reference 1.

The licensee presented the criteria, in Reference 1, for engineering evaluation and additional examinations if unacceptable flaws or relevant conditions are found during examinations. The licensee further stated in Reference 1 that the evaluation will include whether other elements in the segment or segments are subject to the same root cause conditions. In Reference 2, the licensee clarified that additional examinations will be performed on these elements up to a number equivalent to the number of elements required to be inspected on the segment or segments scheduled for the current outage. Reference 2 also stated that elements selected for additional examinations will be selected based on the root cause or damage mechanism and will include high risk-significant, as well as medium risk-significant elements (if needed), to reach the required number of additional elements.

The proposed periodic reporting requirements meet existing ASME Code requirements and applicable regulations and, therefore, are acceptable. The staff finds that the proposed process for RI-ISI program updates meets the guidelines of Reference 4 which provide that risk-informed applications should include performance monitoring and feedback provisions; therefore, the licensee's proposed process for program updates is acceptable.

4.0 CONCLUSIONS

In accordance with 10 CFR 50.55a(a)(3)(i), proposed alternatives to regulatory requirements may be used when authorized by the NRC when the applicant demonstrates that the alternative provides an acceptable level of quality and safety. In this case, the licensee's proposed alternative is to use the risk-informed process described in the NRC-approved Reference 3.

The staff finds that the results of the different elements of the engineering analysis are considered in an integrated decisionmaking process. The impact of the proposed change in the ISI program is founded on the adequacy of the engineering analysis and acceptable change in plant risk in accordance with the guidelines in References 4 and 5.

The DCPP methodology also considers implementation and performance monitoring strategies. Inspection strategies ensure that failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected. The risk significance of piping segments is taken into account in defining the inspection scope for the RI-ISI program.

System pressure tests and visual examination of piping structural elements will continue to be performed on all Class 1, 2, and 3 systems in accordance with the ASME Code, Section XI program. The RI-ISI program applies the same performance measurement strategies as existing ASME Code requirements and, in addition, increases the inspection volumes at weld locations that are exposed to thermal fatigue.

The DCPP methodology provides for conducting an engineering analysis of the proposed changes using a combination of engineering analysis with supporting insights from a PRA. Defense-in-depth and quality are not degraded in that the methodology provides reasonable confidence that any reduction in existing inspections will not lead to degraded piping performance when compared to existing performance levels. Inspections are focused on locations with active degradation mechanisms, as well as selected locations that monitor the performance of system piping. As discussed in Section 3.2 above, the licensee will address any staff concern, if applicable, as a result of a separate, ongoing review on the generic report MRP-24 regarding alternative TASCS screening criteria.

The staff's review of the licensee's proposed RI-ISI program concludes that the program is an acceptable alternative to the current ISI program, which is based on ASME Code, Section XI, requirements for Class 1 and Class 2 welds. In Section 3.1 above, the staff concluded that the licensee's proposed RI-ISI program, as described in its application and supplemental responses to the staff, will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a(a)(3) with regard to the number of inspections, locations of inspections, and methods of inspections. Therefore, the licensee's request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the request provides an acceptable level of quality and safety. This safety evaluation authorizes application of the proposed RI-ISI program during the second 10-year ISI interval for DCPP Units 1 and 2.

5.0 REFERENCES

1. Letter, dated February 16, 2001 (DCL-01-115), David H. Oatley to U. S. Nuclear Regulatory Commission, containing *Relief Request for Application of an Alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI Examination Requirements for Class 1 and 2 Piping Welds*, Diablo Canyon Units 1 and 2.

2. Letter, dated August 24, 2001 (DCL-01-084), Gregory M. Rueger to U. S. Nuclear Regulatory Commission, containing *Response to NRC Request for Additional*

Information Regarding Risk-Informed Inservice Inspection Application for Diablo Canyon Power Plant Units 1 and 2.

3. EPRI TR-112657, Revision B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, January 2000.

4. NRC Regulatory Guide 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*, July 1998.

5. NRC Regulatory Guide 1.178, *An Approach for Plant-Specific Risk-Informed Decisionmaking Inservice Inspection of Piping*, September 1998.

6. NRC NUREG-0800, Chapter 3.9.8, *Standard Review Plan for Trial Use for the Review of Risk-Informed Inservice Inspection of Piping*, September 1998.

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INSERVICE INSPECTION (ISI) RELIEF REQUEST #CRDR-1

Component for Which Relief is Requested

Relief is requested from performance of liquid penetrant (PT) examinations of multiple pass seal weld repairs on the reactor control rod drive mechanism (CRDM) canopy seals.

ASME Section XI Code Requirements

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, 1989 Edition with no Addenda, IWA-4000, requires repairs be performed in accordance with the owner's original construction Code of the component or system, or later editions and addenda of the Code. The Diablo Canyon Power Plant CRDMs were designed and fabricated as ASME B&PV Code, Section III, 1965 Edition, Class A components. The construction code would require PT examination be applicable to an appurtenance to a pressure-retaining component, specifically the multiple pass seal weld repair of CRDM canopy seal welds.

Code Requirement from Which Relief is Requested

Relief is requested to perform visual (VT-1) examinations and pressure verification testing in lieu of performance of PT examinations of multiple pass CRDM seal weld repairs.

Basis for Relief Request

Pacific Gas and Electric Diablo Canyon Power Plant(DCPP) requests relief in accordance with 10 CFR 50.55a(a)(3)(ii) from the required surface examinations on the basis that compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

During routine scheduled inspection of the reactor head area as part of the Unit 2 tenth refueling outage (2R10), PG&E identified boric acid crystal build up from CRDM location H-10. The build up was the result of a small leak in the intermediate CRDM canopy seal weld. This seal weld is required to be repaired prior to completion of 2R10. Industry experience of failure analyses performed on leaking canopy seal welds removed from service at other plants have attributed the majority of the cases to transgranular stress corrosion cracking (SCC). The size of the opening where the leakage occurs has been extremely small, normally a few thousandths of an inch. The crack orientations vary, but often radiate outward such that a pinhole appears on the surface, as opposed to a long crack. The SCC results from exposure of a susceptible material to

INSERVICE INSPECTION RELIEF REQUEST #CRDR-1

Basis for Relief Request (continued)

residual stress, which is often concentrated by weld discontinuities, and to a corrosive environment, such as water trapped in the cavity behind the seal weld that is mixed with the air initially in the cavity, resulting in higher oxygen content than is in the bulk primary coolant.

As allowed by the guidance of Code Case N-504-1, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping Section XI, Division 1," the CRDM canopy seal weld flaws will not be removed, but an analysis of the repaired weldment will be performed using Paragraph (g) as guidance to assure that the remaining flaw will not propagate unacceptably. This analysis establishes the critical flaw size used to qualify the VT-1 examination method to ensure capability of detecting a flaw sufficiently small to assure an adequate margin of safety is maintained. The canopy seal weld is not a structural weld, nor a pressure-retaining weld, but provides a seal to prevent reactor coolant leakage. The weld buildup is considered a repair in accordance with the ASME B&PV Code, Section XI, reference to the original Code of construction, because the weld is performed on an appurtenance to a pressure-retaining component.

Proposed Alternative

The alternative CRDM canopy seal multiple pass weld repair uses a Gas Tungsten Arc Welding (GTAW) process and VT-1 examination controlled remotely. The VT-1 examination will use a video camera with approximately 8X magnification, within several inches of the weld, qualified to ensure identification of a flaw significantly smaller than the analyzed critical flaw size. Alloy 52 nickel-based weld repair material was selected rather than austenitic stainless steel as required by Code Case N-504-1, Paragraph (b), for the repair because of it's resistance to stress corrosion cracking. Consequently, the ferrite requirements of Code Case N-504-1, Paragraph (e) do not apply. The repair will be documented on Form NIS-2, reviewed by the Authorized Nuclear Inspector, and maintained in accordance with the requirements for archiving of permanent plant records.

The GTAW multiple pass weld repair and VT-1 examination methods result in significantly lower radiation exposure because the equipment is remotely operated after setup. The radiation field typical for this type of repair has been measured to be between 0.7 and 1.3 rem/hour.

INSERVICE INSPECTION RELIEF REQUEST #CRDR-1

Justification for Granting of Relief

The remote controlled GTAW multiple pass canopy seal weld repair and VT-1 examination methods significantly reduce total radiological exposure to workers involved with the activity. The construction code required repair method would involve excavation of the flaws and restoration to the original configuration. The construction code repair method requires manual evacuation of the flaws, manual repair welding, and has a higher risk of failure due to the difficulty of making a quality weld on the canopy seal accompanied by the required back-purging and cleaning. The construction code repair method also requires surface examinations in close proximity to the weld area and would incur a significantly higher total radiological exposure to workers.

Implementation Schedule

This relief request will be implemented during the DCPP Units 1 and 2 second ISI intervals.