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May 30, 2000

Docket No. 50-321

HL-5940

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Edwin I. Hatch Nuclear Plant - Unit 1
Reactor Coolant System (RCS) Weld Overlay Examinations

Ladies and Gentlemen:

By letter to the Chairman of the Boiling Water Reactors Vessel Internals Program (BWRVIP) (ref. 1), dated June 17, 1999, the NRC allowed certain boiling water reactor (BWR) plants to defer weld overlay examinations until March 2001 or until the completion of the NRC staff review and approval of a proposed BWRVIP generic report. This deferral is contingent upon the plant meeting the specific criteria.

The described weld overlay examination deferral is applicable to Edwin I. Hatch Nuclear Plant Unit 1. The Unit 1 weld overlay examination is scheduled for the Fall 2000 maintenance and refueling outage (RFO). Therefore, the purpose of this letter is to provide the justification for the requested deferral. The specific criteria and the Southern Nuclear Operating Company's (SNC's) responses are provided in the Enclosure.

The NRC staff also requests licensees to provide information specifying the weld overlays that will not be inspected, and either confirm the respective inspection history cited in BWR Owners Group (BWROG) letter 99024 (ref. 2), dated March 5, 1999, is accurate and current or provide the most current available information. Attachment 1 provides a list of the weld overlays required to be examined during the upcoming Unit 1 Fall 2000 RFO per the requirements of Generic Letter (GL) 88-01, as amended by the Plant Hatch Inservice Inspection Program. Weld overlay examinations were last performed on Unit 1 during the Spring 1999 outage, prior to submittal of the examination summary list previously provided by the BWROG. Attachment 2 provides an accurate, current examination history of Unit 1 weld overlays.

The Plant Hatch Unit 1 Fall 2000 RFO is presently scheduled to begin on September 30, 2000. SNC intends to defer the specified RCS weld overlay examinations for this outage. Therefore, SNC requests that the NRC staff respond to this request by August 11, 2000, if deferral is not acceptable. SNC will continue to support the BWRVIP initiative to develop an alternative to the GL 88-01 RCS weld examination criteria expected to be completed by the end of 2000.

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Should you have any questions in this regard, please contact this office.

Respectfully yours,



H. L. Sumner, Jr.

IFL/eb

- References:
1. NRC Letter to the Chairman of the Boiling Water Reactors Vessel Internals Program (BWRVIP), "Deferment of Inspections for Weld Overlays as Required by Generic Letter 88-01 (TAC No. MA5012," dated June 17, 1999.
 2. BWROG Letter 99024, "BWR Owners Group Program on Weld Overlay Inspection Relief, BWR Project Number 691," dated March 5, 1999.

Enclosure: Criteria for Deferment of Inspections for Weld Overlays as Required by Generic Letter 88-01

- Attachments:
1. Weld Overlay Examinations Scheduled for Refueling Outage 19
 2. Weld Overlay Examination History

cc: Southern Nuclear Operating Company
Mr. P. H. Wells, Nuclear Plant General Manager
SNC Document Management (R-Type A02.001)

U. S. Nuclear Regulatory Commission, Washington, D. C.
Mr. L. N. Olshan, Project Manager - Hatch

U. S. Nuclear Regulatory Commission, Region II
Mr. L. A. Reyes, Regional Administrator
Mr. J. T. Munday, Senior Resident Inspector - Hatch

Enclosure

Criteria for Deferment of Inspections for Weld Overlays as Required by Generic Letter 88-01

NRC Criterion No. 1:

The plant is operated in compliance with the EPRI water chemistry guidelines.

SNC Response:

The Plant Hatch Chemistry Monitoring Program provides guidance for operating both units in accordance with the Electric Power Research Institute's (EPRI) Boiling Water Reactor (BWR) Water Chemistry Guidelines. Water chemistry control parameters are monitored, and action-level values are used to evaluate water chemistry conditions and resolve any problems, as required. A hydrogen water chemistry (HWC) program was implemented on Plant Hatch Unit 1 in September 1987. From 1994 to March 1999 (fuel Cycles 16, 17, and 18), Unit 1 operated under moderate HWC with the following:

- Hydrogen injection at approximately 45 to 55 scfm.
- Conductivity in the 0.08 to 0.14 $\mu\text{S}/\text{cm}$ range.
- Electrochemical potential (ECP) in the -400 to -450 SHE range.

At shutdown from Cycle 18 (Spring 1999), NobleChem was added. During Cycle 19 (current cycle), hydrogen injection is 6 to 8 scfm, and ECP is approximately -450 to -480 SHE.

Criterion No. 2:

The overlay for which deferral is applied meets GL 88-01 or ASME Code Case N-504 (full structural overlay) as opposed to a temporary duty (leakage barrier) overlay.

SNC Response:

Plant Hatch Unit 1 presently operates with the following 54 weld overlays:

1. Fifty-one weld overlays were applied as the result of weld examinations revealing intergranular stress corrosion cracking (IGSCC).
2. Two weld overlays were applied as mitigation techniques for welds that received extensive repairs during replacement of some reactor water cleanup system piping.
3. One weld overlay was applied in the transition area of a pipe-to-valve weld to improve the ultrasonic inspectability of an adjacent weld.

All 54 weld overlays were designed and applied as full structural overlays.

Enclosure
Criteria for Deferment of Inspections for Weld Overlays
as Required by GL 88-01

Criterion No. 3:

The overlays for which the deferral is applied must have been inspected at least two (2) times without IGSCC indications in the overlay. The two examinations include a baseline examination after overlay application and one examination that was completed after the overlay has been in service for at least one full fuel cycle.

SNC Response:

All the weld overlays for which deferral is requested, as well as all 54 weld overlays, were examined at least twice, with no reported indications extending into the weld overlay. The weld overlay examination history is provided in Attachment 2.

ATTACHMENT 1

EDWIN I. HATCH NUCLEAR PLANT UNIT 1
WELD OVERLAY EXAMINATION DEFERRAL

WELD OVERLAY EXAMINATIONS SCHEDULED FOR
REFUELING OUTAGE 19

ATTACHMENT 1

EDWIN I. HATCH NUCLEAR PLANT UNIT 1 WELD OVERLAY EXAMINATION DEFERRAL

WELD OVERLAY EXAMINATIONS SCHEDULED FOR REFUELING OUTAGE 19

<u>Weld Identification</u>	<u>Weld Description</u>
1B31-1RC-12BR-A-4	Pipe to Safe-End
1B31-1RC-12BR-B-3	Elbow to Pipe
1B31-1RC-12BR-C-2	Pipe to Elbow
1B31-1RC-12BR-C-3	Elbow to Pipe
1B31-1RC-12BR-C-4	Pipe to Safe-End
1B31-1RC-12BR-C-5	Safe-End to Nozzle
1B31-1RC-12BR-D-2	Pipe to Elbow
1B31-1RC-12BR-D-3	Elbow to Pipe
1B31-1RC-12BR-E-2	Pipe to Elbow
1B31-1RC-12BR-E-3	Elbow to Pipe
1B31-1RC-12BR-E-4	Pipe to Safe-End
1B31-1RC-12BR-E-5	Safe-End to Nozzle
1B31-1RC-22BM-1	Cap to Pipe
1B31-1RC-28B-2	Safe-End to Pipe
1B31-1RC-28B-3	Pipe to Elbow W
1B31-1RC-28B-4	Elbow to Pipe W
1B31-1RC-28B-11	Elbow to Pump
1B31-1RC-28B-15	Elbow to Pipe
1B31-1RC-28B-16	Pipe to Tee
1G31-1RWCUM-6-D-1	Branch Connection to Pipe

ATTACHMENT 2

EDWIN I. HATCH NUCLEAR PLANT UNIT 1
WELD OVERLAY EXAMINATION DEFERRAL

WELD OVERLAY EXAMINATION HISTORY

ATTACHMENT 2

EDWIN I. HATCH NUCLEAR PLANT UNIT 1 WELD OVERLAY EXAMINATION DEFERRAL

WELD OVERLAY EXAMINATION HISTORY

1B31-1RC-12AR-F-2

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.30" (min. 0.15").

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.46".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 UT60RL-NRI, Shear component due to overlay roughness, confirmed with SMART UT System. Manual exam. 100% coverage.

1991 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI, SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-F-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.26".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.35".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. P-Scan exam. 100% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-F-4

1985/86 Pre-IHSI. UT45S-RI geometry, UT60S-RI one IGSCC indication @ 34", 4.0" long, 13% thru-wall, UT55S(supplemental)-RI one IGSCC indication. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI one IGSCC indication @ 34", 3.2" long, 32% thru-wall. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.42".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 UT60RL-NRI. Manual exam. 100% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12AR-G-3

1985/86 Pre-IHSI. UT45S-RI linear indication intermittent 360, 37% - 50% thru-wall. Manual exam. 100% coverage.

1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Elbow - average overlay effective thickness = 0.35", average overlay actual thickness = 0.57", average elbow wall = 0.78". Pipe - average overlay effective thickness = 0.35", average overlay actual thickness = 0.42", average pipe wall = 0.65". Average overlay thickness is 0.50".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1988 PT-NRI, 60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. P-Scan exam-NRI.

1990 PT-NRI, 60RL-NRI. Manual exam. 100% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-G-4

1985/86 Pre-IHSI. UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-NRI, UT45S-RI IGSCC indication @ 39.5", 20% thru-wall, UT60S-RI geometry. Manual exam. 100% coverage.

1987 PT-NRI, UT45S-RI IGSCC indication 1.0" long, 0.10" deep. Manual exam. 100% coverage.

1988 PT-NRI, UT45S-NRI, UT60S-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT45S-NRI, UT60RL-RI geometry. Manual exam. 100% coverage.

1991 PT-NRI, S.E. Examined manually with 60, Pipe side examined by P-Scan with 45S & 60 RL. Weld was overlay repaired during the 1991 outage. Avg. overlay "T" on pipe side is 0.45", S.E. side is 0.21". Baseline PT-NRI, UT60RL-NRI, ODCR-NRI. Baseline performed by P-Scan. 100% coverage. Average overlay thickness is 0.33".

1993 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-H-2

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.475".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.53".

1987 PT-RI, 2" arc strike in the center of the overlay removed by flapping, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. SMART UT exam. No scan from 9.25" - 11.25" due to grating interference. 95% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12AR-H-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.36".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.46".

1987 PT-NRI, 60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, 60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-RI 2 planar flaws Location 13.4", Length - 3.8", RL-0.46", Location 26.9", Length - 1.3", RL-0.52". P-Scan exam. 100% coverage. Manually, these indications were barely above noise level.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-H-4

1985/86 Pre-IHSI. UT45S-RI geometry, UT60S-RI geometry. UT45S/55S(Supplemental)-RI four IGSCC indications #1 @2.5", 1.0" long, 28% thru-wall, #2 @33.5", 1.0" long, 28% thru-wall, #3 @35.75", 2.0" long, 35% thru-wall, #4 @39.8", 1.0" long, 35% thru-wall. Manual exam. 100% coverage. After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-RI multiple linear indications in weld toes. PT after flapping - NRI, UT60RL-RI IGSCC indication below overlay @ 6.5" - 1.0" long, 0.3" deep, ODCR-RI one axial IGSCC indication below the overlay @ 7.0 CCW - 0.875" long, 0.58" deep. Average overlay effective thickness pipe = 0.34", average overlay actual thickness = 0.475", average pipe thickness = 0.475", average pipe thickness = 0.64". Average overlay effective thickness safe-end = 0.39", average overlay actual thickness = 0.39", average safe-end thickness = 1.15". Manual exam. 100% coverage. Average overlay thickness is 0.43".

1987 PT-NRI, ODCR-RI, UT60RL-RI, planar flaw 1.0" long, 0.62" deep axial. Manual exam. 100% coverage.

1990 PT-NRI, 60RL-NRI. Manual exam. 100% coverage.

1991 60RL-NRI. P-Scan exam. 100% coverage.

1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-J-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-RI original IGSCC indications were recorded below the overlay on the elbow side for 360 degrees. Manual baseline of overlay. Average overlay thickness is 0.28".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-RI 2 linear indications in the downstream weld toe. PT after flapping - NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.38".

1988 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage. (P-Scan Exam NRI)

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-RI interbead lack of fusion 1.3" long @ 28.4" 0.27"RL. Indication also noted RL-0.50" in same location. P-Scan exam. 100% coverage.

1993 UT60RL-RI interbead lack of fusion, ODCR-NRI. Indication was first recorded in 1991 by P-scan. 3 indications were found in 1991, only one could be repeated in 1993. SMART 2000 exam. 100% coverage.

1994 UT60RL-RI Interbead lack of fusion 0.3" long @29.7 0.26" RL. SMART 2000 exam. 100% coverage.

1997 UT60RL-RI interbead lack of fusion 0.5" long @29.1 0.29" RL. ODCR-NRI SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12AR-K-2

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.31".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.40".

1988 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1993 UT60RL-RI Interbead lack of fusion, ODCR-NRI. SMART 2000 exam. INF# I93H1010. 100% coverage.

1994 UT60RL-RI Interbead lack of fusion @ 14.4", 0.30" long, 0.40" deep. SMART 2000 exam. 100% coverage.

1997 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12AR-K-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.31".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.43".

1988 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage. (P-Scan Exam NRI).

1990 PT-NRI, 60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. P-Scan exam. 100% coverage.

1993 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 UT60RL-RI IGSCC indication below the overlay. Located @ 25.7", 3.3" long, 0.80" deep. This is outside of the required exam volume. SMART 2000 exam. 100% coverage.

1997 UT60RL-RI IGSCC indication below the overlay. Ind.#1 located @ 23.9", 3.5" long, 0.74" deep. Ind.#2 located @ 3.25", Axial Ind., 0.52" deep See INF I97H1006 SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-A-4

1985/86 Pre-IHSI. UT45S-RI geometry, UT60S-RI one IGSCC indication @ 23", 2.0" long, 22% thru-wall. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI one IGSCC indication @ 23.8", 2.6" long, 25% thru-wall. Manual exam. 100% coverage.

1987 PT-NRI, UT45S-NRI, UT60S-RI IGSCC 2.0" long, 0.20" thru-wall. Manual exam. 100% coverage.

1988 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage. (P-Scan exam NRI)

1990 UT45S-NRI, UT60RL-RI geometry. Manual exam. 100% coverage.

1991 PT-NRI, UT45S-NRI, UT60S/UT60RL-RI crack indication Rem. lig 0.48". Manual exam from S.E. P-Scan from pipe side. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Average overlay effective thickness = 0.44", average overlay actual thickness = 0.70". Average pipe wall = 0.62", average S.E. thickness = 0.71". Average overlay thickness is 0.71".

1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-12BR-B-3

- 1985/86 Pre-IHSI UT45S-RI geometry, UT60S-RI geometry, UT55S(supplemental)-RI one IGSCC indication @ 36.625", 1.5" long, 15% - 20% thru-wall. Manual exam. 100% coverage.
- 1985/86 Post-IHSI PT-RI water leaking from pipe, visual axial indications at 6", 7.5", & 8.375". UT45S-RI three axial cracks 100% thru-wall. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI. UT0-NRI, UT60RL-RI three IGSCC indications. #1 circ @2.5" - 7.5" long 0.58" deep, @2 axial @ 3.75 CW" - 1.25" long, 0.64" deep, #3 axial @6.0" CCW 1.25" long, 0.58" deep, ODCR-RI three IGSCC indications. #1 circ @3.875" - 1.75" long, 0.78" deep, #2 axial @3.625CW: - 1.25" long, 0.55" deep, #3 axial @1750"CCW 1.0" long, 0.68" deep. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness elbow = 0.35", average overlay actual thickness = 0.43", average elbow thickness = 0.80". Average overlay effective thickness pipe = 0.33", average overlay actual thickness = 0.47", average elbow thickness = 0.65". Average overlay thickness is 0.63".
- 1987 PT-NRI, ODCR-NRI, UT60RL-RI two indications, #1 - 1.25" long, 0.52" deep axial, #2 - 1.25" long, 0.50" deep axial. Manual exam. 100% coverage.
- 1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. P-Scan exam. 100% coverage.
- 1994 UT60RL-RI, five planar flaws #1 @1.7" - 0.30" long, 0.45" deep, #2 @5.2" - 0.50" long, 0.57" deep, #3 @19.4" - 0.30" long, 0.60" deep, #4 @20.6" - 0.15" long, 0.55" deep, #5 @22.6" - 0.15" long, 0.55" deep. ODCR-NRI. All indications are circ cracks. SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-C-2

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.46".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-RI 14" long surface linear indication. PT after flapping - NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.57".
- 1988 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
- 1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. SMART UT exam. 100% coverage.
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-C-3

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.325".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.38".
- 1988 PT-NRI, UT60RL-RI Ind. #1 - 4.1" long, 0.55" deep circ, @2 - 3.5" long, 0.70" deep circ, #3 - 0.5" long, 0.50" deep axial. Manual exam. 100% coverage. (P-Scan Exam confirmation)
- 1990 PT-NRI, UT60RL-RI 3.9" long, 0.54" deep. Manual exam. 100% coverage.
- 1991 UT60RL-RI Ind. #1 - 3.8" long, 0.826" Remaining Lig. (outside of the exam area) Ind., @3 - 0.453" Remaining Lig. (Interbead lack of fusion previously recorded.) P-Scan Exam of overlay. 100% coverage.
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage. One indication recorded in 1991 was seen outside of the required exam volume, the other could not be repeated.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12BR-C-4

1985/86 Pre-IHSI. UT45S-RI three IGSCC indications 33% - 39% thru-wall, UT60S-NRI, UT53S-RI linear indication (supplemental exam for verification). Manual exam. 100% coverage.

1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI. UT0-NRI, UT60RL-NRI, ODCR-NRI. Average overlay effective thickness pipe = 0.40", average overlay actual thickness = 0.47", average pipe thickness = 0.69". Average overlay effective thickness safe-end = 0.30", average overlay actual thickness = 0.30", average safe-end thickness = 1.10". Manual exam. 100% coverage. Average overlay thickness is 0.39".

1988 PT-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. P-Scan Exam indication 1.4" long, 0.52" deep. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. P-Scan exam. 100% coverage.

1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-C-5

1985/86 Pre-IHSI. UT60RL-RI small inclusion or lamination in the safe-end material. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-NRI, UT60S-NRI. Manual exam. 100% coverage.

1988 PT-NRI, UT45S-NRI, UT45RL-RI, UT60RL-RI axial indication 0.15" long, 0.20" deep. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT45RL-NRI. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness elbow = 0.23", average overlay actual thickness = 0.23", average pipe thickness - 1.10". Average overlay thickness is 0.23".

1990 PT-NRI, UT45S-NRI, UT45RL-RI prior IGSCC indication (below exam volume for overlay), UT60RL-NRI. Manual exam. 100% coverage.

1991 UT45S-NRI, UT45RL-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1994 UT45S-NRI, UT45RL-NRI. Manual exam. 100% coverage.

1B31-1RC-12BR-D-2

1985/86 Pre-IHSI. UT45S-RI IGSCC indication @10", 1.0" long, 0.36" thru-wall, UT60S-RI geometry. Manual exam. 100% coverage.

1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-RI multiple linear indications. PT after flapping - NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Pipe - average overlay effective thickness pipe = 0.28", average overlay actual thickness = 0.48", average pipe wall = 0.64". Elbow - average overlay effective thickness = 0.35", average overlay actual thickness = 0.52", average pipe wall = 0.80". Average overlay thickness is 0.50".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. SMART UT exam. 100% coverage.

1993 UT60RL-RI Interbead lack of fusion (new indication), ODCR-NRI. SMART 2000 exam. 100% coverage.

1994 UT60RL-RI Interbead lack of fusion indication @7.7", spot indication 0.60" deep. SMART 2000 exam. 100% coverage

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12BR-D-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.34".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.48".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. Ind#1 - IGSCC outside the exam volume. (0.62" RL), Ind#2 5.6" long, 0.45" deep, Interbead lack of fusion. P-scan exam. 100% coverage.

1993 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. Two indications were previously recorded during the 1991 ISI, P-Scan ultrasonic examination of the weld. P-Scan indication #1 was observed outside of the examination volume with the 60RL, but indication #2 was not recorded with the SMART 2000 system with any search unit. 100% coverage.

1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-E-2

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.35".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.42".

1987 PT-NRI three areas of very small linear indications, removed by flapping, ODCR-NRI, UT60RL-NRI. Manual baseline exam of overlay. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI. SMART UT exam. 100% coverage.

1994 UT60RL-NRI. SMART UT exam. 100% coverage.

1B31-1RC-12BR-E-3

1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.35".

1985/86 UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.38".

1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 UT60RL-NRI Ind. #1 - 1.5" long, 0.649" deep. Ind. #2 - 1.0" long, 0.49" deep. P-Scan exam. 100% coverage.

1994 UT60RL-NRI Interbead lack of fusion indication @24.7", spot indication 0.40" deep (not previously recorded). The two indications recorded by P-Scan in 1991 could not be repeated. SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-12BR-E-4

1985/86 Pre-IHSI. UT45S-NRI, UT60S-RI two IGSCC indications #1 @25.0", 3.5" long, 21% thru-wall, #2 @19.0", 2.0" long, 25% thru-wall. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI one IGSCC indication @ 26.5", 3.5" long, 18% thru-wall. Manual exam. 100% coverage.

1987 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.

1988 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.

1990 PT-NRI, UT45S-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1991 PT-NRI, UT45S-NRI, UT60S/UT60RL-RI crack indication Rem. lig 0.44". Manual exam from S.E. P-Scan from pipe side. Weld was overlay repaired this outage. Baseline exam on overlay-PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Average overlay effective thickness = 0.39", average overlay actual thickness = 0.50". Average pipe wall = 0.64", average S.E. thickness = 0.75". Average overlay thickness is 0.50".

1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-12BR-E-5

1985/86 Pre-IHSI. UT60S-NRI, UT60RL-NRI. Manual exam. 100% coverage.

1985/86 Post-IHSI PT-RI four linear surface indications removed by flapping - NRI, UT60S-NRI. Manual exam. 100% coverage.

1988 PT-NRI, UT45S-NRI, UT45RL-RI, UT60RL-RI axial indication 0.40" long, 0.85" thru-wall. Weld was overlay repaired this outage. Baseline exam on overlay-PT-NRI, UT0-NRI, UT45RL-NRI. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness elbow = 0.21", average overlay actual thickness = 0.21", average pipe thickness = 1.12". Average overlay thickness is 0.21".

1990 PT-NRI, UT45S-NRI, UT45RL-RI, UT60RL-RI prior IGSCC indication 0.70" deep (below exam volume for overlay). Manual exam. 100% coverage.

1991 UT45S-NRI, UT45RL-NRI, UT60RL-RI Previously recorded planar flaw. 0.3" long, 0.69" deep. Manual exam. 100% coverage.

1B31-1RC-22AM-1

1982 Weld was overlay repaired this outage. UT45-RI, PT-NRI.

1985/86 UT45S-RI geometry, UT70RL-NRI. Manual exam. 100% coverage.

1985/86 After surface reconditioning. PT-RI multiple linear indications. PT after flapping - NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.55".

1987 PT-NRI, ODCR-NRI, UT60RL-RI three indications #1 - 1.0" long, 0.54" deep circ, #2&3 are one indication from two directions 0.5" long, 0.80" deep axial. Manual exam. 100% coverage.

1990 PT-NRI, UT60RL-RI 3 previously recorded planar flaws. #1 - 1.0" long, 0.62" deep. #2 -- 1.5" long, 0.90" deep, #3 - 0.5" long, 0.80" deep. Manual exam. 100% coverage.

1991 UT60RL-RI 3 previously recorded planar flaws. #1 - 1.0" long, 0.62" deep, #2 - 1.5" long, 0.90" deep, #3 - 0.50" long, 0.80" deep. Manual exam. 100% coverage.

1994 UT60RL-NRI. Manual exam. 100% coverage.

1996 ODCR-NRI, UR60RL-RI. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-22AM-4

1982 Weld was overlay repaired this outage. UT45-RI.
1985/86 UT45S-RI geometry, UT70RL-NRI. Manual exam. 100% coverage.
1985/86 After surface reconditioning. PT-RI multiple linear indications. PT after flapping - NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.58".
1987 PT-NRI, ODCR-NRI, UT60RL-RI two indications #1 - 0.40" long, 1.16" deep axial, #2 - 0.40" long, 0.76" deep axial. Manual exam. 100% coverage.
1990 PT-NRI, UT60RL-RI 2 previously recorded planar flaws. #1 - 0.30" long, 1.2" deep, #2 - 0.40" long, 0.80" deep. Manual exam. 100% coverage.
1991 UT60RL-RI 1 previously recorded planar flaw, 0.40" long, 0.80" deep. Manual exam. 100% coverage.
1994 UT60RL-RI 1 previously recorded planar flaw, 0.40" long, 0.80" deep. Manual exam. 100% coverage.
1997 60RL-RI 1 ODCR-NRI Flaw # 1, 0.82" deep Flaw # 2, 0.59" deep Smart 2000 coverage 82% Manual exam 18%. coverage 100% coverage combined.

1B31-1RC-22BM-1

1982 Weld was overlay repaired this outage.
1983 UT45-RI. 7 indications below overlay.
1984 PT-NRI, UT45, UT70.
1985/86 UT45S-RI geometry, UT70RL-RI indication 0.4" long, 0.52" deep. Manual exam. 100% coverage.
1985/86 After surface reconditioning. PT-RI multiple surface indications. PT after flapping - NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.52".
1987 PT-NRI, ODCR-NRI.
1990 UT60RL-RI indication 0.70" long, 0.75" deep. Manual exam. 100% coverage. (Indication recorded at 0.85" deep, exam volume is 0.83", due to pipe curvature correction the indication is actually 0.75" deep).
1991 UT60RL-NRI. Manual exam. 100% coverage.
1993 UT60RL-NRI. Manual exam. 100% coverage.
1994 UT60RL-NRI. Manual exam. 100% coverage.

1B31-1RC-22BM-4

1982 Weld was overlay repaired this outage.
1983 UT45-RI. 7 indications below overlay.
1984 PT-NRI, UT0, UT45.
1985/86 UT45S-RI geometry, UT70RL-NRI. Manual exam. 100% coverage.
1985/86 After surface reconditioning. PT-RI 3/16" linear indication. PT after flapping - NRI. UT0-NRI, UT60RL-RI three axial IGSCC indications were recorded below the overlay. #1@6.5"CW - 0.75" long, 0.62" deep, #2@ axial @6.5"CW - 0.75" long, 0.59" deep, #3@8.75"CCW - 0.50" long, 0.80" deep, ODCR-RI two IGSCC indications below the overlay, #1@6.5"CW, 1.25" long, 0.72" deep, #2@7.0CW, 0.75" long, 0.68" deep. Manual exam. 100% coverage. Average overlay thickness is 0.57".
1987 PT-NRI, ODCR-RI two indications #1 - 1.25" long, 0.72" deep axial, #2 - 0.25" long, 0.68" deep axial, UT60RL-RI four axial indications #1 - 0.80" deep, #2 - 0.80" deep, #3 0.60" deep, #4 - 0.80" deep. Manual exam. 100% coverage.
1990 UT60RL-RI six axial indications #1 - 0.5" long, 0.76" deep, #2 - 0.7" long, 0.62" deep, #3 - 0.5", 0.80" deep, #4 - 0.4" long, 0.70" deep, #5 0.7" long, 0.5" deep, #6 - 0.6" long, 0.7" deep. Manual exam. 100% coverage.
1991 UT60RL-RI #1 - 0.5" long, 0.76" deep, #2 - 0.5" long, 0.62" deep, #3 - 0.5", 0.80" deep, #4 - 0.4" long, 0.70" deep, #5 0.7" long, 0.5" deep, #6 - 0.6" long, 0.7" deep. Manual exam. 100% coverage.
1993 UT60RL-RI, Previously recorded (1991) indications - no apparent change. 100% change.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-22BM-4 (continued)

- 1994 UT60RL-RI #1 @ 3.9" - 0.5" long, 0.76" deep, #2 @ 4.1" - 0.5" long, 0.71" deep, #3 @ 2.9" - 0.5", 0.80" deep, #4 @ 2.5" - 0.4" long, 0.70" deep, #5 @ 2.8" 0.7" long, 0.5" deep, #6 @ 2.8" - 0.6" long, 0.7" deep. All indications are circ. Manual exam. 100% coverage.
- 1997 60RL-RI Nine Inds # 1 @ 7.2" - 0.58" deep, #2 @ 9.3" - , 0.87" deep, #3 @ 11.3" - 0.90" deep, #4 @ 43.9" - 0.75" deep, #5 @ 62.0" , 0.64" deep, #6 @ 64.3" - 0.60" deep #7 @ 65.8" - 0.60" deep, #8 @ 69.0" - 0.58" deep, #9 @ 70.1" , 0.65" deep ODCR-NRI Smart 2000 exam. 100% coverage

1B31-1RC-28A-2

- 1985/86 Post-IHSI PT-NRI, UT45S-RI two IGSCC indications #1 @ 8.0" - 1.0" long, 15% thru-wall, #2 @ 12.5" - 5.25" long, 15% thru-wall.
- 1987 PT-NRI, UT45S-RI three IGSCC indications #1 - 0.9" long, 0.22" thru-wall, #2 - 5.2" long, 0.23" thru-wall, #3 - 1.25" long, 0.27" thru-wall. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI three IGSCC indications #1 - 0.9" long, 0.35" thru-wall, #2 - 5.2" long, 0.22" thru-wall, #3 - 1.25" long, 0.30" thru-wall. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI four IGSCC indications #1 - 0.8" long, 0.40" thru-wall, #2 - 5.5" long, 0.57" thru-wall, #3 - 1.25" long, 0.20" thru-wall, #4 - 4.0" long, 0.25" thru-wall. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI, UT60RL-RI, ODCR-RI. Three areas of flaw 360 degrees continuous. LOB and interbead lack of fusion. SMART UT Exam of overlay. 100% coverage. Average overlay effective thickness S.E. = 0.55", average overlay actual thickness = 0.55", average S.E. thickness = 1.65". Pipe - average overlay effective thickness pipe = 0.63", average overlay actual thickness = 0.63", average pipe wall = 1.24". Average overlay thickness is 0.59".
- 1991 UT60RL-RI three IGSCC indications were recorded 360 - #1 - .333" deep, #2 - .233 deep, #3 - .300" deep. Indications compared to previous data. P-Scan exam. 100% coverage.
- 1994 UT60RL-RI, ODCR-RI. Fourteen interbead lack of fusion indications, twelve of these indications can be seen 360 degrees intermittent. These indications correspond to the indications recorded in previous outage. SMART 2000 exam. 100% coverage.
- 1999 UT60RL-RI, ODCR-RI. Fourteen interbead lack of fusion indications, These indications correspond to the indications recorded in previous outage. SMART 2000 exam. 100% coverage.

1B31-1RC-28A-4

- 1985/86 Post-IHSI PT-NRI, UT45S-RI seven axial IGSCC indications. All indications are very short. Thru-wall dimensions 14% maximum. Manual exam. 100% coverage.
- 1987 PT-NRI, UT45S-RI seven IGSCC indications #1 - spot, 0.12" thru-wall axial, #2 - 0.20" long, 0.12" thru-wall axial, #3 - 0.10" long, 0.12" thru-wall axial, , #4 - 0.20" long, 0.12" thru-wall axial, #5 - 0.20" long, 0.12" thru-wall axial, #6 - 0.20" long, 0.12" thru-wall axial, #7 - 0.10" long, 0.12" thru-wall axial. Manual exam. 100% coverage.
- 1988 PT-NRI, UT45S-RI seven IGSCC indications #1 - spot, 0.10" thru-wall axial, #2 - 0.36" long, 0.12" thru-wall axial, #3 - spot, 0.07" long thru-wall axial, , #4 - spot, 0.09" thru-wall axial, #5 - spot, 0.12" thru-wall axial, #6 - spot, 0.12" thru-wall axial, #7 - 0.20" long, 0.11" thru-wall axial. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI twelve IGSCC indications #1 - 0.15" long, 0.22" thru-wall axial, #2 - 0.10" long, 0.25" thru-wall axial,, #3 - 0.15" long, 0.20" thru-wall axial, #4 - 0.20" long, 0.24" thru-wall axial, #5 - 0.15" long, 0.32" thru-wall axial, #6 - 0.15" long, 0.25" thru-wall axial, #7 - 0.15" long, 0.33" thru-wall axial, #8 - 0.15" long, 0.15" thru-wall axial, #9 - 6.85" long, 0.25" thru-wall circ, #10 - 5.0" long, 0.22" thru-wall circ, #11 - 6.5" long, 0.30" thru-wall circ, #12 - 3.25" long, 0.70" thru-wall circ. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. SMART UT baseline exam of overlay. 100% coverage. Average overlay effective thickness elbow = 0.53", average overlay actual thickness = 0.53", average elbow thickness = 1.41". Pipe - average overlay effective thickness pipe = 0.55",

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28A-4 (continued)

- average overlay actual thickness = 0.55", average pipe wall = 1.19". Average overlay thickness is 0.54".
- 1991 60RL-NRI. SMART UT exam. 100% coverage.
1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28A-6

- 1985/86 Pre-IHSI UT45S-RI three linear indications 1 - circ 30% thru-wall, 2 axial 7% thru-wall. Manual exam. 100% coverage.
1985/86 Post-IHSI PT-NRI, UT45S-RI one axial crack, 29% thru-wall. Manual exam. 100% coverage.
1987 PT-NRI, UT45S-RI one axial IGSCC indication 1.10" long, 0.40" thru-wall. Manual exam. 100% coverage.
1988 PT-RI 1/2" linear indication removed by flapping - NRI, UT45S-RI three IGSCC indications #1 - 1.00" long, 0.31" thru-wall axial, #2 - 0.60" long, 0.16" thru-wall axial, #3 - 0.65", 0.12" thru-wall axial. Manual exam. 100% coverage.
1990 PT-NRI, UT45S-RI seven IGSCC indications #1 - 1.75" long, 0.12" thru-wall circ, #2 - 2.20" long, 0.02" thru-wall circ, #3 - 1.20" long, 0.11" thru-wall circ, #4 - 4.70" long, 0.14" thru-wall circ, #5 - 0.60" long, 0.12" thru-wall axial, #6 - 0.70" long, 0.17" thru-wall axial, #7 - 0.95" long, 0.34" thru-wall axial. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI, UT60RL-RI, ODCR-RI. One (1) lack of bond indication with the 0-degree transducer and twenty-two (22) interbead lack of fusion indications with the 60RL and ODCR. SMART UT baseline exam of overlay. 100% coverage. Average overlay effective thickness pipe = 0.65", average overlay actual thickness = 0.65", average pipe thickness = 1.20". Elbow - average overlay effective thickness = 0.62", average overlay actual thickness = 0.62", average elbow wall = 2.0". Average overlay thickness is 0.64".
1991 UT60RL-RI Numerous small lack of fusion indications from 56.4" - 56.9" 0.45" deep. P-Scan exam. 100% coverage.
1994 UT60RL-RI, two interbead lack of fusion indications #1@8.1" - 0.50" long, 0.39" deep, #2@81.9 - 1.6" long, 0.32" deep, ODCR-RI, one interbead lack of fusion indication @81.4" - 0.70" long, 0.34" deep. SMART 2000 exam. 100% coverage.
1999 UT60RL-RI, three interbead lack of fusion indications #1@7.2" - 0.70" long, 0.37" deep, #2@80.8 - 2.16" long, 0.29" deep, #3@ 80.4" - 0.90" long, 0.34" deep. , ODCR-NRI SMART 2000 exam. 100% coverage.

1B31-1RC-28A-7

- 1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
1987 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. One-sided exam due to valve configuration, 75% coverage.
1990 PT-NRI, UT45S-RI, UT60RL-RI two IGSCC indications #1 - 4.9" long, 0.72" thru-wall circ, #2 - 0.25" long, 0.41" thru-wall axial. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI, UT60RL-RI, ODCR-RI. Three lack of bond indication with the 0-degree transducer and five interbead lack of fusion indications with the 60RL and ODCR. SMART UT baseline exam of overlay. 100% coverage. Average overlay effective thickness pipe = 0.77", average overlay actual thickness = 0.77", average pipe thickness = 1.38". Average overlay thickness is 0.77".
1991 ODCR-NRI, UT60RL-RI Six interbead lack of fusion indications, #1 - 0.10" long, 0.68" deep, #2 - 0.10" long, 0.51" deep, #3 - 2.8" long, 0.64" deep, #4 - 0.55" long, 0.28" deep, #5 - 0.40" long, 0.55" deep, #6 - 0.25" long, 0.72" deep. SMART 2000 exam. 100% coverage. 1994 UT60RL-RI three interbead lack of fusion indications,

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28A-7 (continued)

- 1994 UT60RL-RI, three interbead lack of fusion indications #1@9.2" - 0.20" long, 0.60" deep, #2@58.4 - .20" long, 0.52" deep, #3@62.6 - .20" long, 0.63" deep SMART 2000 exam. 100% coverage.
- 1999 UT60RL-RI, two interbead lack of fusion indications #1@59.1 - .40" long, 0.49" deep, #2@62.0 - .3.3" long, 0.61" deep Indication #1 from 1994 was not recorded due to low signal to noise ratio ODCR-NRI SMART 2000 exam. 100% coverage.

1B31-1RC-28A-8

- 1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1987 PT-NRI,
- 1990 PT-RI, 0.30" linear indication removed by flapping, UT45S-NRI, UT60RL-RI Four (4) IGSCC indications. #1 - 0.70" long, 0.18" thru-wall axial, #2 - 1.0" long, 0.10" thru-wall axial, #3 - 1.0" long, 0.12" thru-wall axial, #4 - 13.0" long, 0.45" thru-wall circ. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-RI, ODCR-NRI. Six (6) interbead lack of fusion indications with the 60RL. SMART UT baseline exam of overlay. 100% coverage. Average overlay effective thickness pipe = 0.49", average overlay actual thickness = 0.49", average pipe thickness = 1.14". Average overlay thickness is 0.49".
- 1991 ODCR-NRI, UT60RL-RI Six (6) interbead lack of fusion indications, #1 - 0.30" long, 0.41" deep, #2 - 0.25" long, 0.38" deep, #3 - 0.30" long, 0.41" deep, #4 - 0.50" long, 0.35" deep, #5 - 0.35" long, 0.35" deep, #6 - 0.45" long, 0.39" deep. SMART 2000 exam. 100% coverage.
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage. Manual exam in area of previous indications was NRI.
- 1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28A-10

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.50".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.73".
- 1987 PT-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-NRI. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. Manual exam. 100% coverage.
- 1994 UT60RL-NRI. Manual exam. 100% coverage.
- 1997 60RL-NRI. Manual exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28A-12

- 1985/86 Post-IHSI PT-RI 10 linear indications in a 6" area removed by flapping, UT45S-RI three IGSCC indications 38%, 26% & 41% thru-wall, UT60S-RI one IGSCC indication. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI two lack of bond indications #1@73.0" - 14.5" long, 0.73" deep, #2@68" - 16.25" long, 0.35" deep, UT60RL-RI, three indications #1@74" - 23'5" long, 0.30" deep, #2@88.5 - 40" long, 0.70" deep, #3@81" - 25" long, 0.30" deep, ODCR-RI two indications in the overlay #1 circ @65.5" - 29.5" long, 0.28" deep, #2 circ @65.5 same indication seen from DN scan 0.22" deep. Area from 55" - 95" was repaired. Exam of repair area UT0-RI indication 10.5" long, 0.68" deep, UT60RL one indication 9.0" long, 0.76" deep. Final exam of overlay. UT0-RI two indications #1@61.5" - 8.0" long, 0.80" deep, #2@76.5 - 3.0" long, 0.55" deep, , UT60RL-RI, four indications #1@61.5" - 8.5" long, 0.62" deep, #2@94.5 - 4.75" long, 0.76" deep, #3@61.5" - 6.0" long, 0.80" deep, #4@65.75" - 2.5" long, 0.60" deep. (Indications 1 and 3 appear to be the same indication seen from two directions), ODCR-NRI. 100% coverage. Average overlay effective thickness = 0.64", average overlay actual thickness = 0.80", average pipe thickness = 1.35". Average overlay thickness is 0.80".
- 1987 PT-NRI, ODCR-NRI, UT60RL-RI. Four indications #1 - 8.5" long, 0.58" deep circ, #2 - 4.75" long, 0.68" deep circ, #3 - 6.0" long, 0.70" deep circ, #4 - 2.5" long, 0.54" deep circ. Manual exam. 100% coverage.
- 1990 UT60RL-RI #1 - 8.0" long, 0.55" deep, #2 - 5.5" long, 0.70" deep, #3(4-1987) - 2.0" long, 0.- 55" deep. Manual exam. 100% coverage.
- 1991 UT60RL-RI #1 - 3.6" long, 0.80" deep, #2 - 5.5" long, 0.75" deep, #3 - 2.0" long, 0.70" deep. P-Scan exam. 100% coverage.
UT60RL-RI, four (4) interbead lack of fusion indications. #1@72.6" - 4.0" long, 0.55" deep, #2@84.7 - 2.7" long, 0.70" deep, #3@57.5" - 10.2" long, 0.70" deep, #4@65.7" - 1.1" long, 0.60" deep. SMART 2000 exam. 100% coverage.
- 1997 60RL-RI, ODCR-RI four (4) interbead lack of fusion indications. #1@73.8" - 7.0" long, 0.55" deep, #2@66.0 - 7.8" long, 0.70" deep, #3@69.2" - 1.3" long, 0.60" deep, #4@72.7" - 0.9" long, 0.70" deep. SMART 2000 exam. 91% coverage, 9 % manual coverage 100% total coverage.

1B31-1RC-28A-14

- 1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1988 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1990 UT45S-RI, UT60RL-RI Nine axial IGSCC indications. #1 - 0.98" long, 1.03"(29%) deep, #2 - 0.84" long, 0.30"(29%) deep, #3 - 0.77" long, 0.91"(37%) deep, #4 - 0.77" long, 1.08"(26%) deep, #5 - 0.42" long, 1.01"(30%) deep, #6 - 0.84" long, 1.06"(27%) deep, #7 - 0.56" long, 1.24"(15%) deep, #8 - 0.28" long, 1.08"(26%) deep, #9 - 0.56" long, 0.96"(34%) deep. SMART UT exam. 100% coverage. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-RI, ODCR-RI. Three interbead lack of fusion indications with the 60RL and ODCR. #1 circ #1 - 0.50" long, 0.40" deep, #2 - 0.50" long, 0.28" deep, #3 - 0.40" long, 0.37" deep. SMART UT baseline exam of overlay. 100% coverage. Elbow - average overlay effective thickness = 0.68", average overlay actual thickness = 0.68", average elbow thickness = 1.48". Pipe - average overlay effective thickness = 0.65", average overlay actual thickness = 0.65", average pipe wall = 1.37". Average overlay thickness is 0.67".
- 1991 UT60RL-RI Three (3) interbead lack of fusion indications #1 - 0.50" long, 0.40" deep, #2 -- 0.50" long, 0.28" deep, #3 - 0.40" long, 0.37" deep. SMART 2000 exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28A-14 (continued)

- 1994 UT60RL-NRI, the three previously recorded indications were not recorded during this examination. A manual relook of these areas were unable to confirm these indications. SMART 2000 exam. 100% coverage.
- 1997 60RL-NRI, ODCR-NRI the three previously recorded indications were observed at low amplitudes. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-2

- 1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1987 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
- 1991 PT-NRI, UT45S-RI three IGSCC indications #1 - 2.2" long, 0.50" thru-wall, #2 - 4.0" long, 0.42" thru-wall, #3 - 0.85" long, 0.25" thru-wall. P-Scan exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Average overlay effective thickness S.E. = 0.57", average overlay actual thickness = 0.67", average S.E. thickness = 1.53". Pipe - average overlay effective thickness pipe = 0.73", average overlay actual thickness = 0.81", average pipe wall = 1.6". Average overlay thickness is 0.74".
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.
- 1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-3

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.50".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT- NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.61".
- 1987 PT- NRI, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage.
- 1990 60RL-NRI. Manual exam. 100% coverage.
- 1991 60RL-NRI. P-Scan exam. 100% coverage.
- 1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
- 1994 60RL-RI, one (1) IGSCC indication below the overlay @37.1", 0.70" long, 1.1" deep. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-4

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.63".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-RI linear indications in the upstream weld toe. PT after flapping - RI 3 Code allowable surface indications, UT0-NRI, ODCR-NRI, UT60RL-RI four indications #1 - spot @11.8", 0.60" deep, #2 - 1.05" long, @ 12.25", 0.62" deep, #3 - spot @56", 0.60" deep, #4 - 1.2" long @56", 0.54" deep. Manual exam. 100% coverage. Average overlay thickness is 0.73".
- 1987 PT-NRI, ODCR-NRI, UT60RL-RI eight non-geometric circ. indications #1 - 0.50" long, 0.60" deep, #2 - 0.38" long, 0.50" deep, #3 - 0.62" long, 0.46" deep, #4 - 0.50" long, 0.64" deep, #5 - 1.25" long, 0.50" deep, #6 - 1.0" long, 0.57" deep, #7 - 6.0" long, 0.46" deep, #8 - 2.0" long, 0.68" deep. Manual exam. 100% coverage.
- 1990 UT60RL-RI fourteen (14) non-geometric indications #1 - 1.8" long, 0.675" deep, #2 - 1.0" long, 0.69" deep, #3 - 1.45" long, 0.75" deep, #4 - 0.60" long, 0.60" deep, #5 - 1.75" long, 0.54" deep, #6 - 0.90" long, 0.69" deep, #7 - 0.75" long, 0.66" deep, #8 - spot, 0.57" deep, #9 - 3.0" long, 0.63" deep, #10 - 0.35" long, 0.84" deep, #11 - 2.0" long, 0.78" deep, #12 - spot, 0.78" deep, #13 - 0.75" long, 0.69" deep, #14 - 2.0" long, 0.60" deep. Supplemental exam to locate three (3) 1987 indications, #1 - 0.60" long,

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-28B-4 (continued)

- 0.70" deep, #2 - 1.0" long, 0.65" deep, #3 - 2.0" long, 0.80" deep. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. P-Scan exam. 100% coverage.
- 1993 UT60RL-RI, ODCR-RI, the 60RL and ODCR search units did record 28 interbead lack of fusion indications, 15 on the upstream side and 13 on the downstream side of the overlay. 7 indications recorded during the 1990 manual exams were not recorded by the SMART 2000 system with either search unit. All previous data with the ODCR was NRI. No indications were recorded by the P-Scan during the 1991 outage. SMART 2000 exam. 100% coverage.
- 1994 UT60RL-RI, ODCR-RI, the 60RL and ODCR search units did record 30 interbead lack of fusion indications, 16 on the upstream side and 14 on the downstream side of the overlay. Twenty-eight of these indications were recorded in 1993. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-8

- 1985/86 Post-IHSI PT-NRI, UT45S-RI two axial IGSCC indications 24% & 16% thru-wall, UT60S-RI geometry. Manual exam. 100% coverage.
- 1987 PT-NRI, UT60S-NRI, UT45S-RI three axial IGSCC indications. #1 - 0.25" long, 0.20" thru-wall, #2 - 0.25" long, 0.20" thru-wall, #3 - 0.30" long, 0.25" thru-wall. Manual exam. 100% coverage.
- 1988 PT-NRI, UT60S-NRI, UT45S-RI two axial IGSCC indications. #1 - 0.25" long, 0.22" thru-wall, #2 - 0.25" long, 0.20" thru-wall. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI, UT60RL-RI, eight IGSCC indications #1 - 0.2" long, 0.45" thru-wall axial, #2 - 0.25" long, 0.30" thru-wall axial, #3 - 0.20" long, 0.30" thru-wall axial, #4 - 0.15" long, 0.85" thru-wall axial, #5 - 0.85" long, 0.36" thru-wall axial, #6 - 0.15" long, 0.65" thru-wall axial, #7 - 0.15" long, 0.46" thru-wall axial, #8 - 0.60" long, 0.30" thru-wall circ. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI, UT60RL-RI, ODCR-NRI. One (1) lack of bond indication, one interbead lack of fusion indication 0.20" long, 0.41" deep. SMART UT exam of overlay. 100% coverage. Pipe - average overlay effective thickness pipe = 0.59", average overlay actual thickness = 0.59", average pipe wall = 1.37". Average overlay thickness is 0.59".
- 1991 UT60RL-RI two previously recorded indications 25.4" - 31.7" & 40.0" - 41.2" no apparent change. P-Scan exam. 100% coverage.
- 1994 UT60RL- RI one (1) interbead lack of fusion @ 5.8", 0.20" long, 0.40" deep.. SMART 2000 exam. 100% coverage.
- 1999 UT60RL- RI one (1) interbead lack of fusion @ 5.6", 0.20" long, 0.40" deep.. ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-9

- 1985/86 Post-IHSI PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1988 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
- 1990 Weld was overlay repaired this outage. PT-NRI, UT45S-RI three IGSCC indications #1 - 2.2" long, 0.50" thru-wall, #2 - 4.0" long, 0.42" thru-wall, #3 - 0.85" long, 0.25" thru-wall. P-Scan exam. 100% coverage.
- 1991 PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Average overlay effective thickness S.E. = 0.57", average overlay actual thickness = 0.67", average S.E. thickness = 1.53". Pipe - average overlay effective thickness pipe = 0.73", average overlay actual thickness = 0.81", average pipe wall = 1.6". Average overlay thickness is 0.74".
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.
- 1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28B-10

- 1985/86 Post-IHSI PT-NRI, UT45S-RI six IGSCC indications 4 circ (14.5% - 22.5% thru-wall), 2 axial (25.8% - 30.6% thru-wall), UT60S-RI geometry. Manual exam. 100% coverage.
- 1987 PT-NRI, UT60S-RI, UT45S-RI, five IGSCC indications. #1 - 2.5" long, 0.30" thru-wall circ, #2 - 1.0" long, 0.20" thru-wall circ, #3 - 13.0" long, 0.20" thru-wall circ, #4 - 0.375" long, 0.35" thru-wall axial, #5 - 0.375" long, 0.31" thru-wall axial. Manual exam. 100% coverage.
- 1988 PT-NRI, UT60S-RI, UT45S-RI, five IGSCC indications. #1 - 2.5" long, 0.24" thru-wall circ, #2 - 1.0" long, 0.24" thru-wall circ, #3 - 13.0" long, 0.21" thru-wall circ, #4 - 0.50" long, 0.32" thru-wall axial, #5 - 0.50" long, 0.28" thru-wall axial. Manual exam. 100% coverage.
- 1990 PT-NRI, UT45S-RI, UT60RL-RI, five IGSCC indications #1 - 2.5" long, 0.40" thru-wall circ, #2 - 1.0" long, 0.40" thru-wall circ, #3 - 17.0" long, 0.25" thru-wall circ, #4 - 0.45" long, 0.72" thru-wall axial, #5 - 0.45" long, 0.80" thru-wall axial. Manual exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-RI, UT60RL-RI, ODCR-RI. Three (3) lack of fusion indications, #1 - 0.20" long, 0.24" deep, #2 - 0.20" long, 0.27" deep, #3 - 0.30" long, 0.47" deep. One non-geometric indication outside the exam volume, 1.9" long, 1.0" deep, and two lamellar type indications outside the exam volume 0.5"x0.5", 1.1" deep, 0.5"x0.63, 0.9" deep. Manual exam of overlay. 100% coverage. Pipe - average overlay effective thickness = 0.60", average overlay actual thickness = 0.60", average pipe wall = 1.20". Elbow - average overlay effective thickness = 0.52", average overlay actual thickness = 0.52", average pipe wall = 1.47". Average overlay thickness is 0.56".
- 1991 60RL-RI two indications #1 (IGSCC) - 1.9" long, 0.98" deep, #2 (interbead lack of fusion) - 0.3" long, 0.45" deep. SMART 2000 exam. 100% coverage.
- 1993 60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
- 1994 60RL-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-11

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.48".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-RI multiple surface indications. PT after flapping - RI 2 3/16" linear indications. PT after flapping - RI 1/32" long linear indication, Code Allowable, UT0-NRI, ODCR-NRI, UT60RL-RI non-relevant indications were recorded. Manual exam. 100% coverage. Average overlay thickness is 0.71".
- 1988 UT60RL-RI two indications 360 intermittent 0.40 & 0.41" deep. Manual exam. 100% coverage.
- 1990 UT60RL-NRI. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. Manual exam. 100% coverage.
- 1993 UT60RL-NRI. Manual exam. 100% coverage.
- 1994 UT60RL-NRI. Manual exam. 100% coverage.

1B31-1RC-28B-13

- 1985/86 Post-IHSI PT-RI five areas of linear indications removed by flapping, UT45S-RI geometry, UT60S-RI geometry. Limited exam due to valve configuration. Approx. 75% coverage.
- 1987 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Limited exam due to valve configuration. Approx. 75% coverage.
- 1990 UT45S-RI, UT60RL-RI. One IGSCC indication 6.2" long, 0.70" remaining ligament (47% thru-wall) circ. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-RI, ODCR-RI. Ten (10) interbead lack of fusion indications. SMART UT exam of overlay. 100% coverage. Pipe - average overlay effective thickness = 0.61", average overlay actual thickness = 0.61", average pipe wall = 1.36". Average overlay thickness is 0.61".
- 1991 UT60RL-NRI. P-Scan exam. 100% coverage.
- 1994 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
- 1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1B31-1RC-28B-14

- 1985/86 Post-IHSI PT-RI two linear indications 3/17" long removed by flapping, UT45S-RI geometry, UT60S-RI geometry. Manual exam. One-sided exam due to valve configuration. 75% coverage.
- 1987 PT-RI six areas of Code allowable rounded or linear indications, UT45S-NRI, UT60S-NRI. Manual exam. One-sided exam due to valve configuration. 75% coverage.
- 1990 UT45S-RI, UT60RL-RI, five IGSCC indications #1 - 15.0" long, 1.05" remaining ligament (24% thru-wall) circ, #2 - 5.0" long, 1.0" remaining ligament (24% thru-wall) circ, #3 - 0.60" long, 1.05" remaining ligament (24% thru-wall) axial, #4 - 0.30" long, 0.85" remaining ligament (38% thru-wall) axial, #5 - 0.60" long, 1.02" remaining ligament (26% thru-wall) axial. SMART UT exam. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. SMART UT exam of overlay. 100% coverage. Elbow - average overlay effective thickness pipe = 0.66", average overlay actual thickness = 0.66", average pipe wall = 1.47". Average overlay thickness is 0.66".
- 1991 UT60RL-NRI. P-Scan exam. 100% coverage.
- 1994 UT60RL-NRI, SMART 2000 exam. 100% coverage.
- 1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-15

- 1985/86 Post-IHSI PT-RI two areas of linear and rounded indications removed by flapping, UT45S-RI geometry, UT60S-RI geometry. Manual exam. 100% coverage.
- 1987 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
- 1990 UT45S-RI, UT60RL-RI, eleven IGSCC indications #1 - 0.70" long, 0.52" remaining ligament (61% thru-wall) circ, #2 - 1.7" long, 0.60" remaining ligament (55% thru-wall) circ, #3 - 18.5" long, 0.60" remaining ligament (55% thru-wall) axial, #4 - 12.4" long, 0.45" remaining ligament (66% thru-wall) axial, #5 - 11.6" long, 0.52" remaining ligament (61% thru-wall) axial, #6 - 1.1" long, 0.50" remaining ligament (62% thru-wall) circ, #7 - 28.0" long, 0.48" remaining ligament (64% thru-wall) circ, #8 - 1.7" long, 0.60" remaining ligament (55% thru-wall) circ, #9 - 4.0" long, 0.52" remaining ligament (61% thru-wall) circ, #10 - 65.2" long, 0.42" remaining ligament (68% thru-wall) circ, #11 - 8.9" long, 0.45" remaining ligament (66% thru-wall) circ. SMART UT exam. 100% coverage. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. SMART UT exam of overlay. 100% coverage. Elbow - average overlay effective thickness = 0.67", average overlay actual thickness = 0.67", average elbow wall = 1.49". Pipe - average overlay effective thickness = 0.65", average overlay actual thickness = 0.65", average pipe wall = 1.38". Average overlay thickness is 0.66".
- 1991 60RL-RI interbead lack of fusion indication, 0.30" long, 0.80" deep. SMART 2000 exam. 100% coverage.
- 1993 60RL-RI previously recorded interbead lack of fusion indication, 0.30" long, 0.80" deep. SMART 2000 exam. 100% coverage.
- 1994 UT60RL-RI, interbead lack of fusion indication @ 0.65", 0.30" long, 0.65" deep. SMART 2000 exam. 100% coverage.

1B31-1RC-28B-16

- 1985/86 Pre-IHSI UT45S-RI, four linear circ indications (IGSCC) 7% - 20% thru-wall. (Relook showed 14 indications, 3 axial), UT60S-RI linear circ indication seen 360 degrees intermittent. Manual exam. 100% coverage.
- 1985/86 Post-IHSI PT-NRI, UT45S-RI, three IGSCC indications 24%, 18%, & 40% thru-wall, 3 AXIAL CRACKS, UT60S-RI geometry. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness = 0.43", average overlay actual thickness = 0.73", average pipe thickness = 1.39". Average overlay thickness is 0.73".
- 1987 PT-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1B31-1RC-28B-16 (continued)

1990 UT60RL-NRI. Manual exam. 100% coverage.
1991 UT60RL-NRI. SMART 2000 exam. 100% coverage.
1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1E11-1RHR-20B-D-3

1982 Weld was overlay repaired this outage.
1984 PT-NRI, UT0, UT45, UT70.
1985/86 UT70RL-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
1985/86 After surface reconditioning. PT-NRI, UT0-RI indication recorded in the pipe wall past the overlay interface, UT60RL-NRI, ODCR-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.51".
1987 PT-NRI, UT60RL-NRI, UT70RL-NRI. Manual exam. 100% coverage.
1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
1991 UT60RL-NRI. P-Scan exam. 100% coverage.
1993 UT60RL-NRI, ODCR-RI interbead lack of fusion (new indication). See INF #193H1006. SMART 2000 exam. 100% coverage.
1994 UT60RL-RI interbead lack of fusion @49.4", 0.37" long, 0.40" deep, ODCR-NRI. SMART 2000 exam. 100% coverage.

1E11-1RHR-20B-D-4

1985/86 PT-NRI, UT45S-RI two axial IGSCC indications (18% & 16% thru-wall). Manual exam. 100% coverage.
1987 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
1988 PT-NRI, UT45S-RI geometry. Manual exam. 100% coverage.
1990 PT-NRI, UT45S-NRI. Manual exam. 100% coverage.
1991 PT-NRI, UT45S-RI low level IGSCC (Approx. 0.135" thru-wall). P-Scan exam. 100% coverage. Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Average overlay effective thickness = 0.45", average overlay actual thickness = 0.45". Average pipe wall = 0.93". Average overlay thickness is 0.45".
1993 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.
1999 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.

1E11-1RHR-20B-D-5

1985/86 PT-RI 10 linear and rounded indications removed by flapping, UT45S-RI geometry, UT60S-NRI. One-sided exam due to valve configuration. 100% coverage.
1988 PT-NRI, UT45S-RI geometry, UT60S-NRI. Manual exam. One-sided exam due to valve configuration. 100% coverage.
1990 PT-NRI, UT45RL-RI geometry, UT60RL-RI geometry. Manual exam. 100% coverage.
1991 PT-NRI, UT45S-NRI. P-Scan exam. 100% coverage. Weld was overlay repaired this outage due to proximity to 20B-D-4 overlay. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. P-Scan exam of overlay. 100% coverage. Pipe average overlay effective thickness = 0.51", average overlay actual thickness = 0.51". Average pipe wall = 0.93". Valve average overlay effective thickness = 0.40", average overlay actual thickness = 0.40". Average pipe wall = 1.05". Average overlay thickness is 0.46".
1993 UT60RL-NRI, ODCR-NRI. SMART 2000 exam. 100% coverage.
1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

**ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY**

1E11-1RHR-24A-R-13

- 1984 Weld was overlay repaired this outage. UT0-NRI, UT70RL-NRI. Manual baseline of overlay. Average overlay thickness is 0.19".
- 1985/86 UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-NRI, UT0-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.29".
- 1987 PT-RI eight linear indication found in the Inconel weld area, all are code allowable, UT60RL-NRI. Manual exam. 100% coverage.
- 1990 PT-NRI, UT60RL-RI, two (2) interbead lack of fusion indications. #1 - 0.50" long, 0.32" deep, #2 - 0.70" long, 0.28" deep. Manual exam. 100% coverage.
- 1991 UT60RL-NRI. SMART 2000 exam. 100% coverage.
- 1994 UT60RL-NRI. SMART 2000 exam. 100% coverage.

1E11-1RHR-24B-R-12

- 1985/86 Weld was overlay repaired this outage for inspectability due to proximity of weld 13. UT0-RI LOB @57.5" 1.5" long, 0.40" deep, UT60RL-RI indication @65.5" 1.0" long, 0.50" deep, ODCR-NRI. Manual exam. 100% coverage. UT thickness recorded no change. Average overlay thickness is 0.52".
- 1987 PT-RI nine Code allowable linear indications, ODCR-NRI, UT60RL-RI three non-geometric circ indications #1@14" - 0.50" long, 0.40" deep, #2@35.25" - 0.70" long, 0.50" deep, #3@65.5" - 1.0" long, 0.40" deep. Manual exam. 100% coverage.
- 1990 PT-RI three linear indications 0.156", 0.175", and 0.0625" long, all Code allowable. UT60RL-RI five (5) interbead lack of fusion indications #1@14.5" - 0.90" long, 0.30" deep, #2@18.5" - 1.0" long, 0.40" deep, #3@34.2" - 0.90" long, 0.50" deep, #4@52.5" - 0.55" long, 0.50" deep, #5@63.8" - 0.80" long, .047" deep. Manual exam. 100% coverage.
- 1991 UT60RL-RI seven interbead lack of fusion indications #1@14.6" - 0.38" long, 0.33" deep, #2@19.5" - 0.78" long, 0.45" deep, #3@34.9" - 0.58" long, 0.53" deep, #4@53.7" - 0.38" long, 0.41" deep, #5@64.9" - 0.78" long, 0.44" deep, #6@72.4" - 0.58" long, 0.60" deep, #7@38.2" - 0.38" long, 0.53" deep. 6&7 not previously recorded. SMART 2000 exam. 100% coverage.
- 1993 UT60RL-RI, ODCR-NRI. Four of seven interbead lack of fusion indications were recorded, the other three were seen at less than recordable amplitude. SMART 2000 exam. 100% coverage.
- 1994 UT60RL-RI seven interbead lack of fusion indications #1@14.6" - 0.38" long, 0.35" deep, #2@18.0" - 0.75" long, 0.43" deep, #3@34.3" - 0.75" long, 0.50" deep, #4@52.9" - 0.38" long, 0.43" deep, #5@64.9" - 0.60" long, 0.43" deep, #6@72.4" - 0.38" long, 0.57" deep, #7@37.9" - 0.38" long, 0.55" deep. 1&4 were seen at less than recordable amplitude. SMART 2000 exam. 100% coverage.

1E11-1RHR-24B-R-13

- 1982 Weld was overlay repaired this outage.
- 1984 PT-NRI, UT0, UT45.
- 1985/86 UT45S-RI geometry. UT70RL-NRI. Manual exam. 100% coverage.
- 1985/86 After surface reconditioning. PT-RI two linear indications 1/16" - 1/8" long, PT after flapping - NRI, UT0-NRI, ODCR-NRI, UT60RL-NRI. Manual exam. 100% coverage. Average overlay thickness is 0.34".
- 1988 PT-NRI, ODCR-NRI, UT60RL-RI transducer lift off. Manual exam. 100% coverage.
- 1990 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
- 1991 ODCR-NRI, UT60RL-RI five (5) indications of IGSCC in the original pipe wall were recorded along with one (1) interbead lack of fusion indication in the overlay material. #1@2.4" - 0.40" long, 0.63" deep, #2@3.2" - 0.15" long, 0.58" deep, #3@4.2" - 0.25" long, 0.40" deep, #4@8.5" - 0.60" long, 0.53" deep, #5@14.1" - 0.60" long, 0.74" deep, #6@21.3" - 0.30" long, 0.43" deep. SMART 2000 exam. 100% coverage.
- 1993 UT60RL-RI, ODCR-NRI. Six interbead lack of fusion indications were recorded, these had been recorded in the 1991 ISI. SMART 2000 exam. 100% coverage.

ATTACHMENT 2
WELD OVERLAY EXAMINATION DEFERRAL
WELD OVERLAY HISTORY

1E11-1RHR-24B-R-13 (continued)

1994 UT60RL-RI five (5) indications of IGSCC in the original pipe wall were recorded along with one (1) interbead lack of fusion indication in the overlay material. #1@3.0" - 0.18" long, 0.65" deep axial, #2@3.3" - 0.18" long, 0.65" deep axial, #3@4.5" - 0.18" long, 0.40" deep axial, #4@8.5" - 0.36" long, 0.70" deep axial, #5@14.4" - 0.36" long, 0.70" deep axial, #6@21.6" - 0.18" long, 0.45" deep axial. SMART 2000 exam. 100% coverage.

1G31-1RWCUM-6-D-1

1985/86 Pre-IHSI. UT45S-NRI, UT60S-NRI. Manual exam. One-sided exam due to valve configuration. 100% coverage.
1985/86 Post-IHSI. PT-NRI, UT45S-RI geometry, UT60S-NRI. Manual exam. 100% coverage.
1987 PT-NRI, UT45S-RI geometry, UT60S-RI geometry. Manual exam. One-sided exam due to branch connection configuration. 100% coverage.
1988 Weld was overlay repaired this outage. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness elbow = 0.43", average overlay actual thickness = 0.43", average pipe thickness = 0.44".
1991 UT60RL-NRI. Manual exam. 100% coverage.
1994 UT60RL-NRI. Manual exam. 100% coverage.

1G31-1RWCUM-6-D-9

1985/86 Pre-IHSI. UT45S-NRI. Manual exam. 100% coverage.
1985/86 Post-IHSI. PT-NRI, UT45S-NRI. Manual exam. 100% coverage.
1987 PT-NRI, UT45S-NRI. Manual exam. 100% coverage.
1988 Weld was overlay repaired this outage due to numerous welding defects. Baseline exam on overlay - PT-NRI, UT0-NRI, UT60RL-NRI, ODCR-NRI. Manual baseline exam of overlay. 100% coverage. Average overlay effective thickness pipe = 0.27", average overlay actual thickness = 0.43", average pipe thickness = 0.54". Average overlay effective thickness elbow = 0.27", average overlay actual thickness = 0.25", average elbow thickness = 0.25". Average overlay thickness is 0.49".
1991 PT-NRI, UT60RL-NRI. Manual exam. 100% coverage.
1997 UT60RL-NRI. Manual exam. 100% coverage.