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PG&E Letter DCL-16-036

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.55a

Docket No. 50-275, OL-DPR-80
Diablo Canyon Power Plant Unit 1

ASME Section XI Inservice Inspection Program Request for Relief NDE-SIF-U1 to Allow Use of Alternate Examination Volume Coverage Requirements

Dear Commissioners and Staff:

Pursuant to 10 CFR 50.55a(g)(5)(iii), Pacific Gas and Electric Company (PG&E) hereby requests NRC approval of Inservice Inspection Request for Relief NDE-SIF-U1 for the Diablo Canyon Power Plant Unit 1 third inservice inspection interval. Relief is requested from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for examination coverage of Class 2 seal injection filter pressure vessel welds. The details of the relief request are enclosed.

PG&E requests approval of NDE-SIF-U1 by November 1, 2016. PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this letter. If you have any questions or require additional information, please contact Mr. Hossein Hamzehee at (805) 545-4720.

Sincerely,

James M. Welsch

rntt/4231/50033145-125
Enclosure
cc: Diablo Distribution
cc/enc: Marc L. Dapas, NRC Region IV Administrator
Gonzalo L. Perez, Branch Chief, California Department of Public Health
Balwant K. Singal, NRR Project Manager
Binesh K. Tharakan, NRC Acting Senior Resident Inspector
State of California, Pressure Vessel Unit

10 CFR 50.55a Request NDE-SIF-U1

Relief Request in Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

1. ASME Code Component(s) Affected

Diablo Canyon Power Plant (DCPP), Unit 1, American Society of Mechanical Engineers (ASME) Section XI, Code Class 2 seal injection filter pressure vessel welds (two welds):

Code Cat.	Item No.	Description	Weld Number	Outage Examined
C-A	C1.10	Unit 1 Seal Injection Filter Shell-to-Flange Weld	GA	1R19
C-A	C1.20	Unit 1 Seal Injection Filter Shell-to-Head Weld	GB	1R19

2. Applicable Code Edition and Addenda

The DCPP Unit 1 third interval Inservice Inspection (ISI) Program Plan is based on the ASME Boiler and Pressure Vessel Code, Section XI, 2001 Edition through 2003 Addenda.

3. Applicable Code Requirement

ASME Section XI, Table IWC-2500-1, Category C-A, Item No. C1.10 and Item No. C1.20 each require that seal injection filter vessel welds be volumetrically examined once during the ISI interval. Essentially 100 percent of the full volume of the weld and adjacent base material is to be examined in accordance with the requirements of Appendix I, I-2210. The applicable examination volume is defined by Figure IWC-2500-1 and the examination is performed per the rules of ASME Section XI, Appendix III, as supplemented by Table I-2000-1.

4. Impracticality of Compliance

The Unit 1 seal injection filter vessel shell-to-head and shell-to-flange weld configurations are such that essentially 100 percent coverage of the ASME Code required examination volume from the outside diameter is not feasible, as

determined during the third interval examinations conducted in the DCPP Unit 1 nineteenth refueling outage (1R19).

Background Information

The DCPP seal injection filter vessel shell is fabricated from SA312 TP 304 material with a nominal shell thickness of 0.940 inch. The head and flange are fabricated from SA240 TP 304, with the head nominal thickness of 1.0 inch and the flange with a nominal 0.940-inch thickness at the weld and having a 3-5/8 inch thick cover bolted to it. The vessel nominal diameter is 10 inches.

The subject welds were examined in 1R19 to the extent practicable using a 45-degree angled shear wave and 60-degree longitudinal waves. For the shell-to-flange weld GA, the 45-degree and 60-degree angles were used for the axial scans from the shell side in order to achieve the maximum possible coverage of the Code-specified examination volume; the flange configuration precludes axial examination from the flange side of the weld. For the shell-to-head weld GB, the 45-degree and 60-degree angles were used for the axial scans from the shell side in order to achieve the maximum possible coverage of the Code-specified examination volume; the head configuration limits axial examination from the head side of the weld. The 45-degree angle was used for circumferential scan examinations for both welds. No flaws were detected in any of the examinations of the subject welds.

The circumferential length of each weld is limited by various appurtenances. The shell-to-flange weld GA has a nameplate and a support for the lid davit arm that are welded to the shell. These two items combine to preclude examination for a total of 8 inches of the 33.77-inch circumference of the weld, resulting in 76.3 percent of the total length that can be examined. The shell-to-head weld GB is limited by three support legs and an inlet nozzle. These four items combine to preclude examination for a total of 15.77 inches of the 33.77-inch circumference of the weld, resulting in 53.3 percent of the total length that can be examined.

The exam volume coverage attained for each weld in the axial (up direction and down direction; average of 45-degree and 60-degree angles) and circumferential (clockwise [CW] and counterclockwise [CCW]; 45-degree angle only) scan directions, a combined average coverage value, and total combined coverage are summarized in Table 1. Figures 1 through 5 illustrate the coverage for each of the inspection angles and directions used to determine coverage values.

Table 1: Volume Coverage Summary

Weld	Axial Up and Down Volume Coverage[1]	Circumferential CW and CCW Volume Coverage	Combined Coverage[2]	Circumferential Examination Extent	Total Combined Coverage[3]
GA shell-to-flange	72.7%	72.7%	72.7%	76.3%	55.4%
GB shell-to-head	96.7%	100%	98.3%	53.3%	52.4%

[1] Combined coverage average for 45- and 60-degree angles.
[2] The reported combined coverage value is an equal weighted average of the coverage values from each of the four scan directions.
[3] The reported total combined coverage value is combined coverage percentage times circumferential examination extent.

Impracticality

For the shell-to-flange weld GA, the flange transition proximity to the weld constitutes geometric restrictions that preclude full examination volume coverage from the outside surface by preventing axial examination from the flange. In addition, the nameplate and davit support arm are welded to the vessel, thereby preventing removal. For the shell-to-head weld GB, the transition to the curvature of the head results in a loss of contact for the transducer and a change in resultant sound angle. This constitutes a geometric restriction that precludes full examination volume coverage from the outside surface by limiting axial examination from the head. In addition, the three support legs and inlet nozzle are welded to the vessel, thereby preventing removal.

5. Burden Caused by Compliance

The Code requirement of "essentially 100 percent" coverage of the exam volume from the outside surface would require redesign of the seal injection filter vessel to move the welds farther back from the flange and head, or elimination of the shell-to-flange weld by integrally incorporating the flange into the shell. Welded supports and the inlet nozzle would require relocation. Any of these modifications would effectively result in performing major redesign and rework, or replacement of the entire seal injection filter vessel.

Performing examinations from the inside diameter of the seal injection filter vessel would require accessing the small, 10-inch nominal diameter vessel below

an external shielding structure and work in a high-contamination, high-risk, foreign material exclusion area. Additionally, an internal filter support structure exists that limits access to the shell-to-head weld.

These efforts, required to attain a small incremental increase in coverage, would incur increased personnel radiation exposure and an increase in personnel safety risk due to work in a difficult to access and highly constrained, as well as contaminated, work environment, without a commensurate increase in examination effectiveness.

6. Proposed Alternative and Basis for Use

PG&E proposes that the ultrasonic examinations conducted to the maximum extent practicable from the outside surface provide reasonable assurance that the structural integrity of the subject welds remains intact.

The 1R19 examinations were implemented to the extent practicable using manual scan techniques and an additional 60-degree longitudinal wave search unit in an effort to attain the greatest possible coverage of the required examination volume. The volume examined on both of the subject welds includes the weld and surrounding base material near the inside surface of the weld joint, which is typically the highest stress region and where degradation would likely manifest should it occur.

The 1R19 ultrasonic examinations, with combined coverage values of 55.4 percent for weld GA and 52.4 percent for weld GB, with no defects detected, provide reasonable assurance that the structural integrity of these welds remains intact and provide an acceptable level of quality and safety.

Potential Failure Consequences

A failure of a seal injection filter weld could result in a loss of seal injection water. The worst-case consequence would occur if a seal injection filter weld was to suffer 360-degree circumferential cracking. The seal injection filter can be manually isolated with flow going through the second redundant seal injection filter vessel.

System leakage tests in accordance with the pressure test requirements of ASME Boiler and Pressure Vessel Code Section XI, Examination Category C-H have been performed on the seal injection filters with no flaws detected.

Essentially no change to overall plant safety is expected due to implementation of the proposed alternative in lieu of the Code requirement. This conclusion is based on the effectiveness of ultrasonic examination, and little or no historical occurrence of large service-induced planar flaws in this type of weldment.

7. Duration of Proposed Alternative

Relief is requested for the DCPP Unit 1 third ISI interval. The DCPP Unit 1 third ISI interval ended on November 6, 2015, coincident with the completion date of 1R19 in accordance with ASME Section XI, Paragraph IWA-2430(d)(1).

8. Precedents

This request is similar to Relief Request S1-13R-114 for Salem Nuclear Generating Station Unit 1 (TAC Number ME8565). S1-13R-114 was approved by the NRC in a letter dated April 22, 2013 (ML13071A215). It is also similar to Relief Request RR-G-5 for Kewaunee Power Station (TAC Number ME7378). RR-G-5 was approved by the NRC in a later dated September 20, 2012 (ML12249A441).

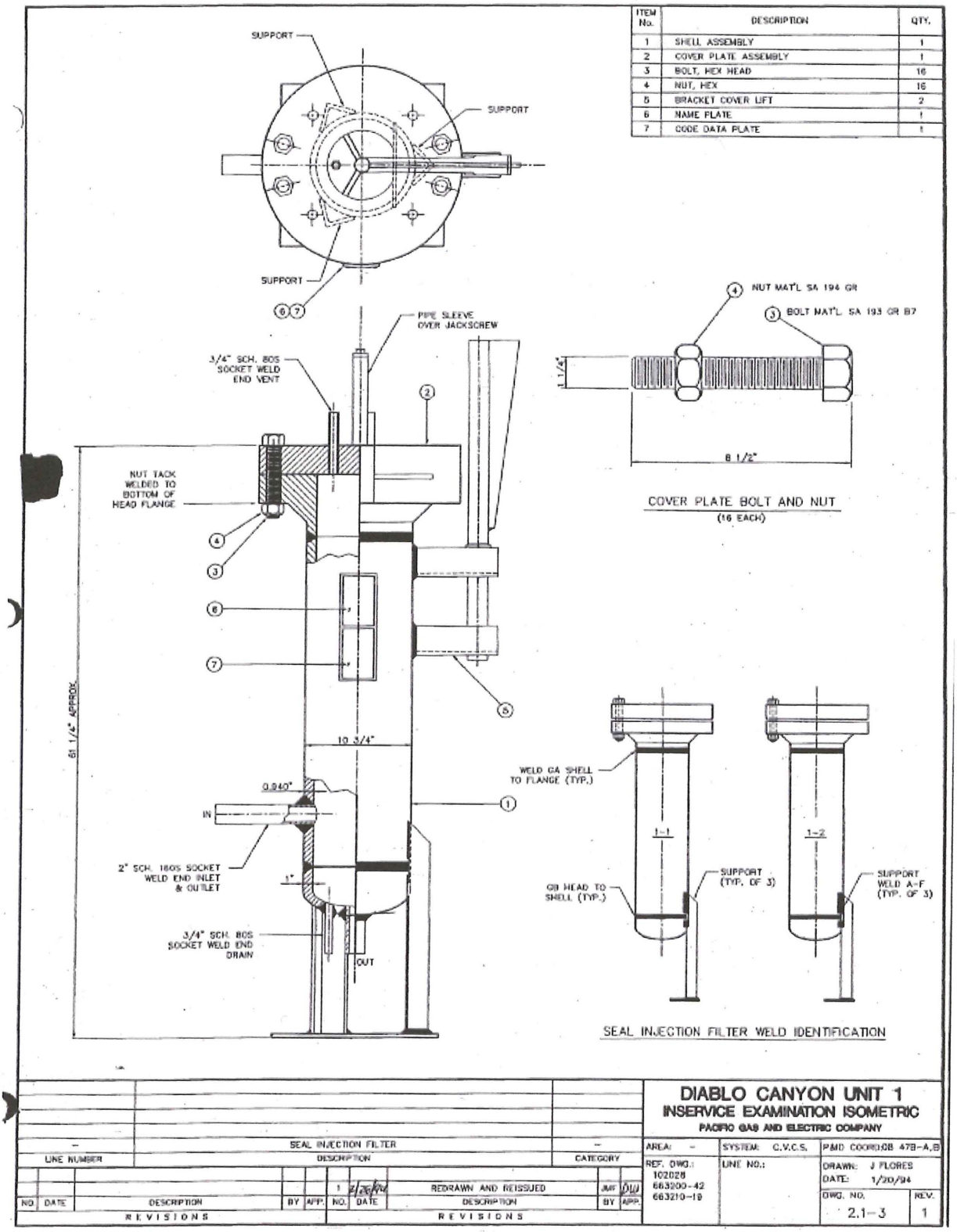

Figure 1: Seal Injection Filter Layout

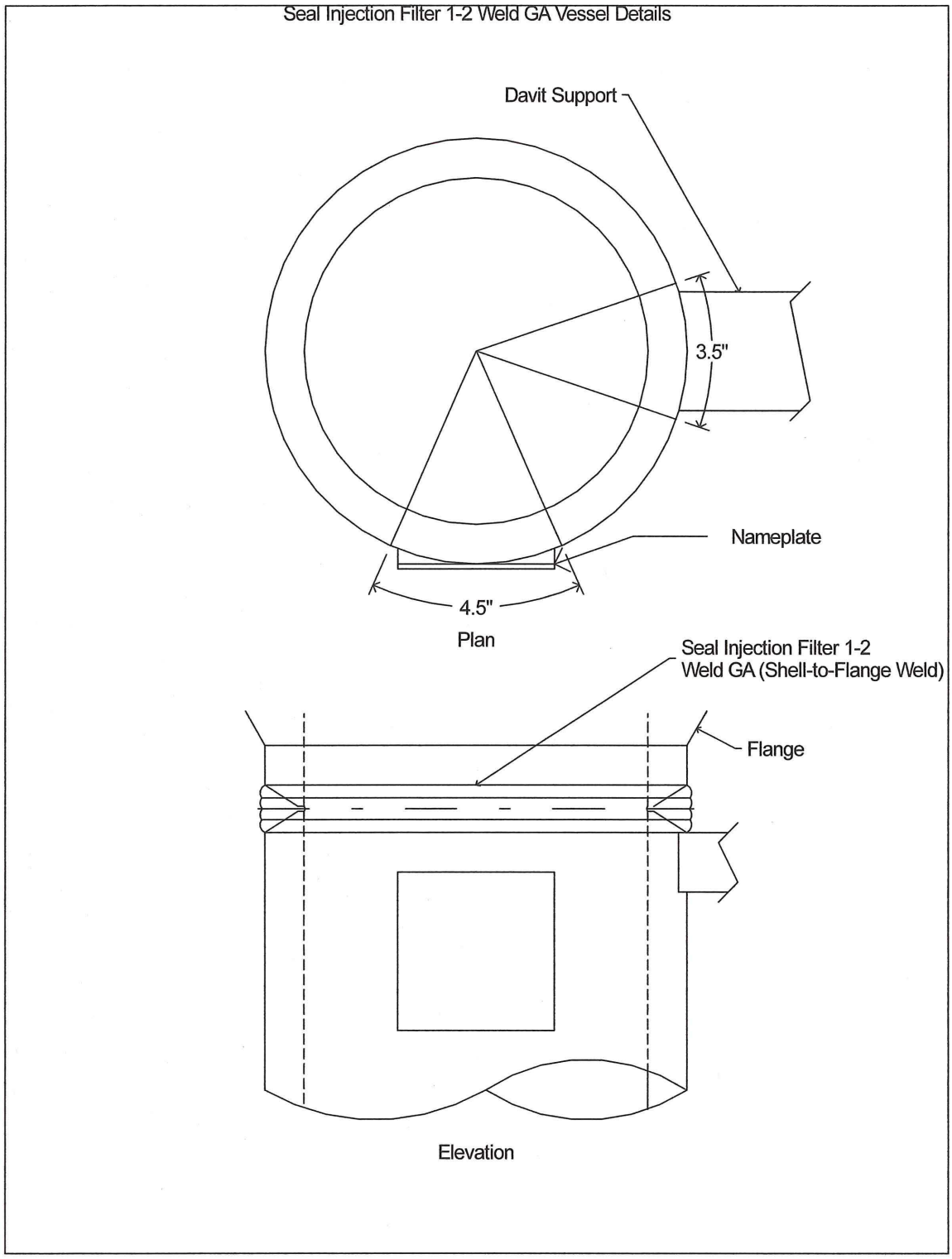

Figure 2: Shell-to-Flange Weld GA Layout

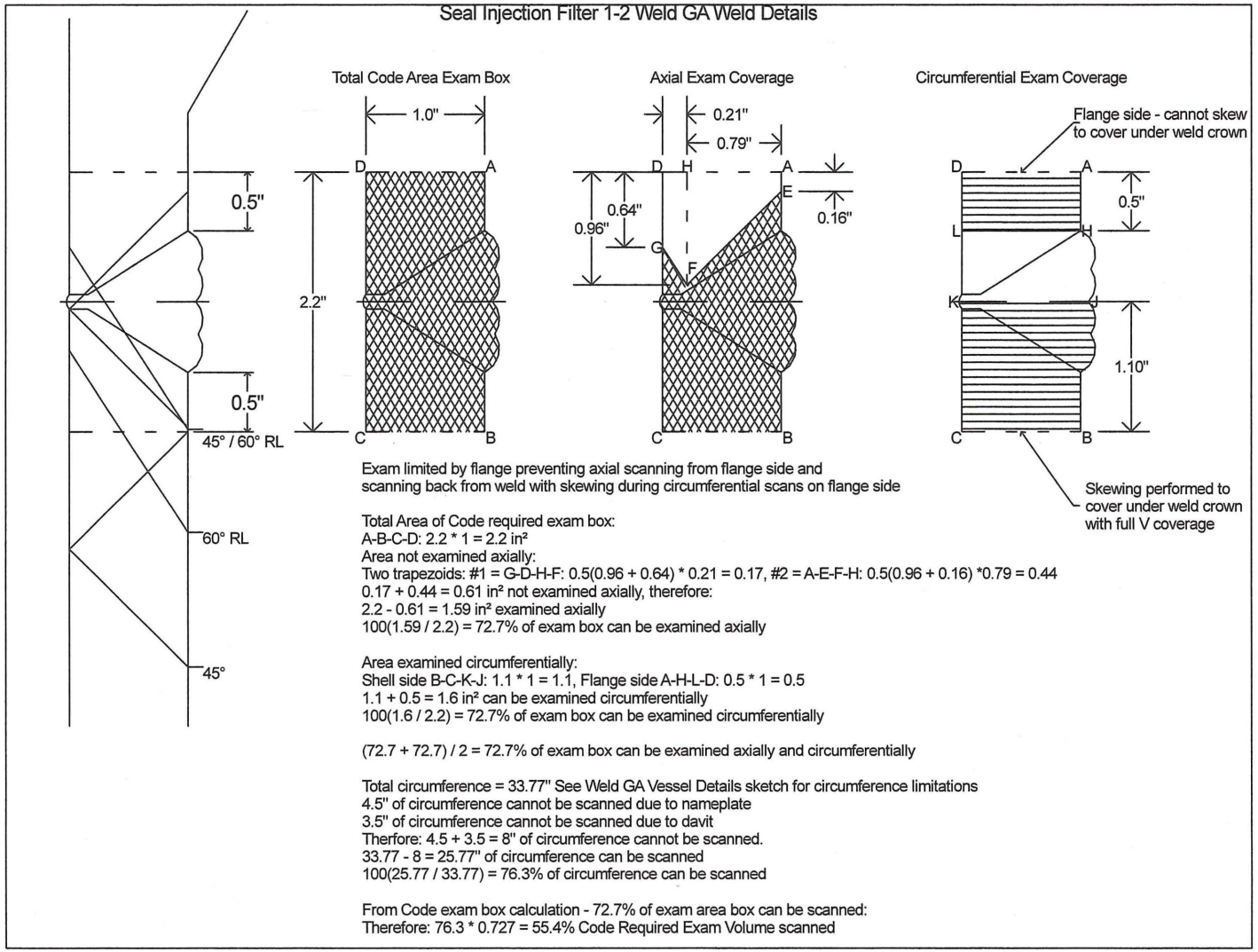

Figure 3: Shell-to-Flange Weld GA Details

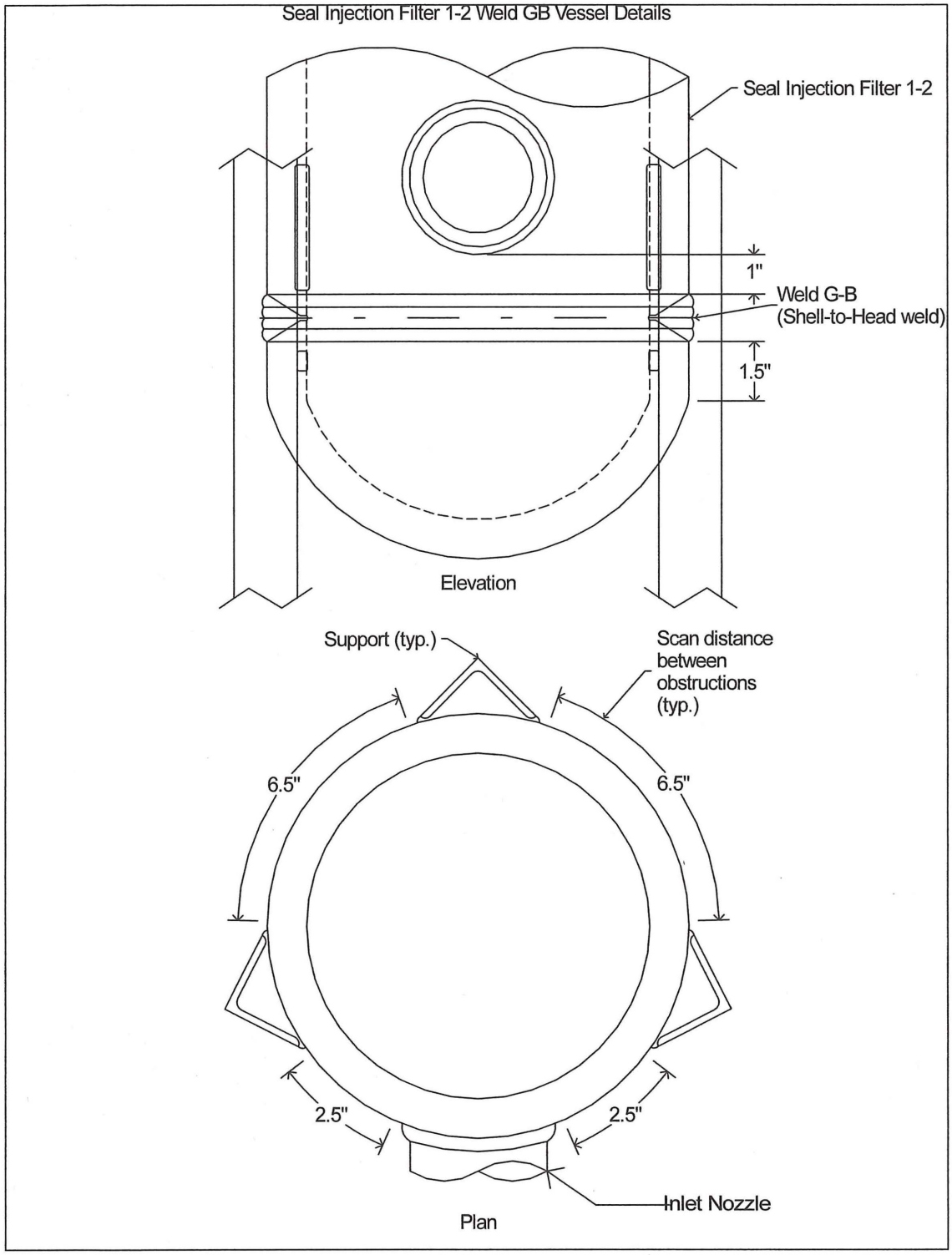

Figure 4: Head-to-Shell Weld GB Layout

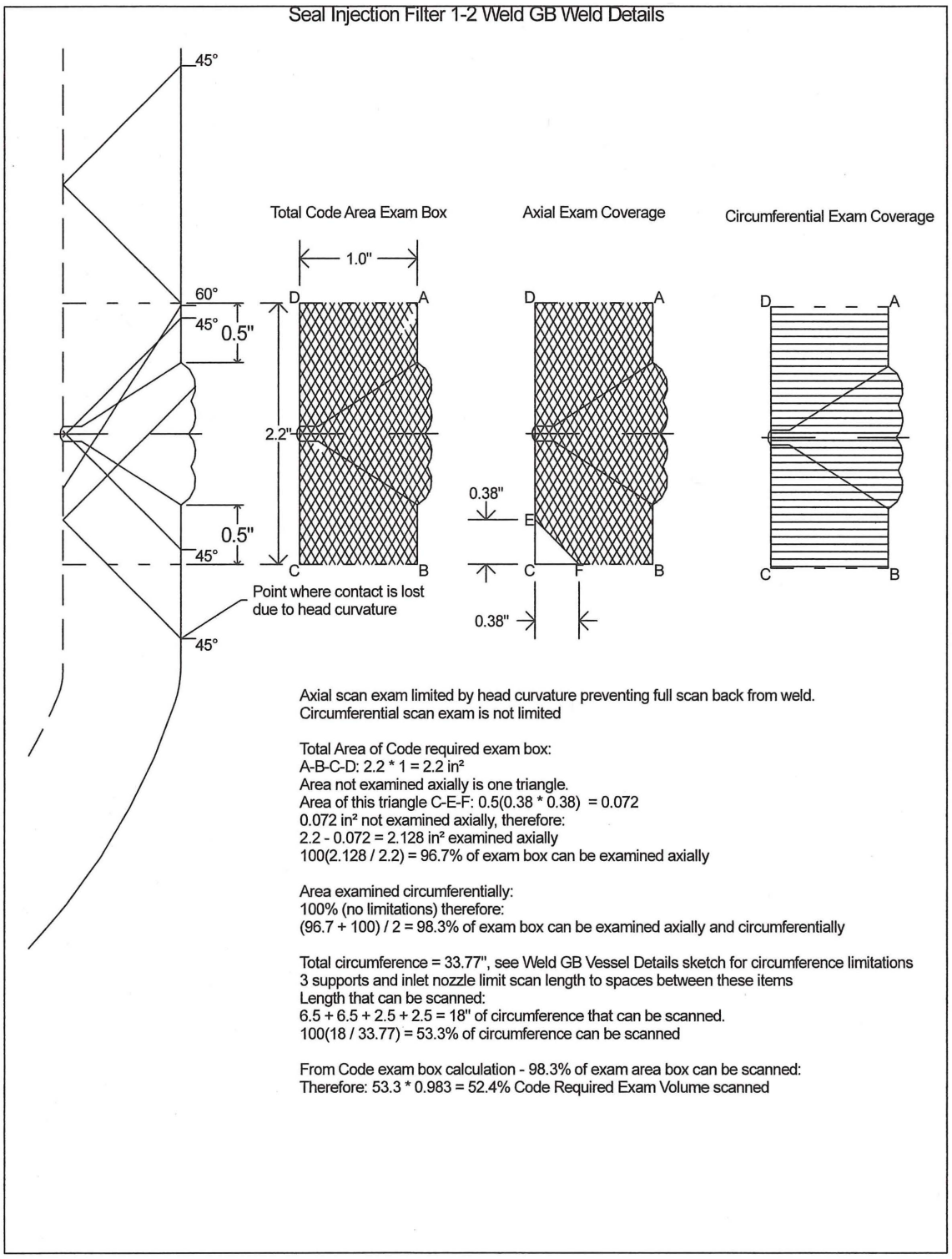

Figure 5: Head-to-Shell Weld GB Details