δesfα.	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-023 Rev. 1		Page 1 of 10	



1	Second Issue	30-06-2021	KD	DK	TPI
0	First Issue	05-04-2011	PQ DPT.		V.G.
REV	DESCRIPTION	DATE	PRPD	CHKD	APVD

Sesfa	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-023 Rev. 1		Page 2 of 10	

REVISION HISTORICAL SHEET

Rev.	Date	Description
0	05/04/2011	First Issue (as Spec 500/8)
1	30/06/2021	Second Issue validated from TPI

Sesfa	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-023 Rev. 1		Page 3 of 10	

Table of Contents

1	SCOPE AND OBJECTIVES	.4
2	REFERENCES	.4
3	ACRONYMS	.5
4	GENERAL	.5
5	TEST METHODS	.6
6	EXTENT OF TESTING	.6
7	PERFORMANCE OF TESTS	.7
8	EVALUATION AND TEST RECORDS	.8
9	REJECTION OF WELDS	.9
10	COST OF INSPECTION	.9

Sesfa	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No: DSF-SPC-PIP-0	23	Rev. 1	Page 4 of 10

1 SCOPE AND OBJECTIVES

This Specification covers welding inspection of piping at Metering and Regulating Stations including tie-in welds.

For the performance of welding inspection, the requirements of the following shall be fulfilled.

- This Specification.
- Documents to which reference is made in the following.
- ELOT EN 12732
- Job Spec. No. DSF-SPC-PIP-039

2 REFERENCES

2.1 Reference Documents

Job Spec. No. DSF-SPC-PIP-012 [Welding]

Job Spec. No. DSF-SPC-PIP-039 [Welding of Piping for M/R Stations]

2.2 Reference Codes and Standards

EN 12732 [Gas supply systems - Welding steel pipework - Functional requirements]

EN 9606-1 [Qualification testing of welders. Fusion welding. Steels]

EN ISO 9712 [Non-destructive testing - Qualification and certification of NDT personnel - General principles]

EN ISO 16826 [Non-destructive testing. Ultrasonic testing. Examination for discontinuities perpendicular to the surface]

EN ISO 16810 [Non-destructive testing – Ultrasonic Testing General principles]

EN ISO 17638



[Non-destructive examination of welds. Magnetic particle examination of welds]

EN ISO 17636-1 [Non-destructive testing of welds. Radiographic testing. X- and gamma-ray techniques with film]

EN ISO 17637 [Non-destructive testing of welds. Visual Testing of fusion-welded joints]

3 ACRONYMS

NDT: Non Destructive Testing

SMYS: Specified Minimum Yield Strength

4 GENERAL

All completed welding work shall be subject to a series of tests to control and assure the quality of the work.

Non-destructive testing shall be performed by a company accredited to EN ISO 17020 or EN ISO 17025 for the corresponding tests. The Contractor shall schedule sufficient time within contract time for carrying out these tests.

Weld seams shall not be insulated or coated in any way before tests have been made and approval by Owner has been given.

If a weld selected for testing has been coated in any way, it shall be brought to the Contractor's attention, for subsequent removal of the applied material.

If the Inspector appointed by the Owner finds any weld seams without proper marking and traceability, these shall be brought to the Contractor's attention for subsequent numbering according to the welding specification.

Any tests performed on weld seams without proper marking will be regarded as invalid.

The Accredited NDT company shall be responsible for preventing access to those areas where X-rays or isotopes are used for testing.

Contractor shall be responsible for forwarding all information to Owner's Representative, regarding all repair situations - before the repair takes place. No weld shall be released for further works such as coating, pressure testing etc. if it has not been accepted by the Owner's appointed Inspector.



5 TEST METHODS

The following test methods shall be used as appropriate:

- Visual examination of welds
- Radiographic testing for butt-welds with all pipe materials and wall thicknesses shall be as per EN ISO 17636-1 Class B. Evaluation and acceptance criteria shall be according to Job Spec. No. DSF-SPC-PIP-012.
- Ultrasonic testing shall be applicable for materials with thickness exceeding 6.5 mm. Applicable standard: EN ISO 16810.
- Magnetic Particle testing for stud connections, fillet welds, etc. Applicable standard: EN ISO 17638.
- Dye Penetration testing for fillet welds, branch connections and for controlling that cracks in the weld seams are totally removed before repair. Applicable standard: EN ISO 3452.
- Destructive testing for certain girth welds, to be specified by Owner Representative. Applicable standard: EN 12732.

6 EXTENT OF TESTING

6.1 GIRTH WELDS

6.1.1 WORKSHOP WELDS

When the welding program is started, all workshop performed girth welds in pipes with external diameter $DN \ge 25$ shall be tested along their entire circumference by radiography or ultrasonic testing as agreed on by Owner's Representative.

All workshop performed girth welds in pipes with external diameter DN < 25 shall be visually inspected along their entire length. When Owner's Representative is satisfied that the quality of welding work has reached the desired level, the frequency of inspection may be decreased to cover 60% of the entire length of the weld seams.

Any subsequent increase of test frequency due to inferior weld quality shall be paid by the contractor, conforming to section 10.

6.1.2 SITE WELDS

δesfa	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-023 Rev. 1		Page 7 of 10	

All girth welds performed on site shall be 100% tested by radiography or ultrasonic testing, as agreed by Owner's Representative.

6.2 TIE IN WELDS

Tie-in welds shall be 100% radiographically or ultrasonically tested.

In case of guarantee welds, all seams shall be tested 100% with both radiographic and ultrasonic testing.

If, during the evaluation, it is necessary to make additional testing by other methods, it will be agreed on by Owner's Representative.

6.3 REPAIR WELDS

All such seams shall be tested 100% with radiographic testing to be sure that all defects which necessitate the repair are removed.

In case of guarantee welds, repaired area shall be tested 100% with both radiographic and ultrasonic testing.

If, during the evaluation, it is necessary to make additional testing by other methods, this shall be agreed on by Owner's Representative.

Type and extent of additional inspection will be agreed on by Owner's Representative.

Reference regarding possible extension of inspection due to high rejection rate of welds, is made in Section 10.

7 PERFORMANCE OF TESTS

For test work, only personnel skilled and experienced in the particular type of inspection may be used.

For ultrasonic testing, personnel shall be qualified according to EN ISO 9712 - level II.

For Radiographic testing, personnel shall be qualified according to EN ISO 9712 - level II.

The testing shall be performed in accordance with the standards mentioned in section 5, for each specific test.

Additionally, the following requirements shall be applied.



7.1 RADIOGRAPHIC TESTING

Films shall be numbered with the number of the respective seam. For an indication of position, a circumferential tape measure with a centimeter division shall be used.

Reference point and circumferential direction shall be marked at the seam with water resistant chalk.

Welder identification number shall also be marked on the seam.

7.2 ULTRASONIC TESTING

For items constructed of steel, with SMYS equal to or higher than 360 MPa, the ultrasonic examination shall be executed after at least 24 hours have elapsed since the completion of the seam. Exceptions to this may be made if directed by Owner's Representative.

7.3 DESTRUCTIVE TESTING

Owner's Representative is entitled to select some seams for destructive testing.

The Contractor is responsible for cutting out the seams, beveling the pipe ends and rewelding the joint. The destructive tests shall, unless otherwise agreed, be made in accordance with the requirements of the welding qualification procedure testing.

8 EVALUATION AND TEST RECORDS

All The welding inspector shall have a suitable period (normally 1-2 days) after the testing for the evaluation of the quality of the welds.

The welds shall be evaluated according to paragraph 5 above.

The conclusion of the inspector's evaluation shall be one of the following statements:

- weld accepted,
- weld to be repaired,
- weld to be cut out.

Final evaluation and acceptance of welds will be made by the Owner's appointed Inspector regarding the seam as a whole.

Special Precautions for Cracks:

Sesfa	Hellenic Gas Transmission System Op 357-359 Messogion Av., GR 152 31 Halar Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr	erator S.A. ndri	TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-023 Rev. 1		Page 9 of 10	

Owner's Representative shall be informed immediately about the occurrence of any cracks or possible cracks.

A crack may indicate one or more faults in the applied welding procedure, and therefore, the last welds made by the welder(s) in question as well as the neighboring seams shall be ultrasonically tested, even though they may previously have been radiographically tested.

Under these circumstances, the ultrasonic results shall take precedence over the radiographic results.

8.1 TEST RECORD

The test record, in accordance with the standard form used by the NDT company, shall be completed for each weld or type of weld.

A record, covering the testing performed, shall be completed each working day.

9 **REJECTION OF WELDS**

Where defects are present in the seams, the Contractor shall be informed of the character of the defect and on the necessary actions (e.g. removal and reweld, or repair). The Contractor shall be given a copy of the test record.

The new or repaired weld is classified "Repair Weld" and shall be tested according to Section 6.3 of the present specification.

10 COST OF INSPECTION

The costs of the initial testing of a weld within the extent stated in **section 6** shall be paid for by the Contractor.

For welds, which have been renewed or repaired, the Contractor will bear the costs for renewal or repair, retesting of the weld as well as for the testing of one additional weld, at the choice of Owner's Representative.

If this seam does not comply with the requirements, the control may be further extended.

Any expenses arising from an increase of the inspection extent, stated in **Section 6.1** shall be paid by the Contractor.

If the weld rejection rate exceeds 10% of the welds tested, Owner's Representative is allowed to increase the general extent of testing. The Contractor shall pay for the increased testing.

Sesfa	Hellenic Gas Transmission System Operator S.A. 357-359 Messogion Av., GR 152 31 Halandri Tel.: 213 088 4000 Fax: 210 674 9504 Email: desfa@desfa.gr		TECHNICAL SPECIFICATION
Doc No : DSF-SPC-PIP-0	23	Rev. 1	Page 10 of 10

The extent of any such supplementary control work shall be decided by Owner's Representative, with the aim of establishing in a satisfactory manner whether the welding work satisfies the specified requirements.

All costs in connection with destructive testing will be paid by Owner if the results are acceptable. If the results are unacceptable, the Contractor shall pay these costs.