PETROBRAS

N-2200	REV. F	ENGLISH	05 / 2017

CONTEC
Comissão de Normalização Técnica

SC-13
Oil and Gas Pipelines

Signage of Pipeline Right-of-Way and Onshore Production Facility

2nd Amendment

This is the 2nd Amendment to PETROBRAS N-2200 REV. F, incorporated the 1st amendment and it is used to alter the text of the Standard in the part(s) indicated below:

NOTE 1 The new(s) page(s) with the performed amendment(s) is (are) placed in its corresponding position(s).
NOTE 2 The amended pages, indicated the date of the amendment, are placed at the end of this standard, in chronological order, and shall not be used.

CONTENTS OF THE 1st AMENDMENT - 11/2015

Embedded in text.

CONTENTS OF THE 2nd AMENDMENT - 05/2017

- Subsection 4.7.

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Signage of Pipeline Right-of-Way and Onshore Production Facility

Procedure

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

"This Standard is exclusive property of Petróleo Brasileiro S. A. - PETROBRAS, internal application and PETROBRAS Subsidiaries and shall be used by its suppliers of goods and services under contracts or similar under the conditions established in Bidding, Contract, Agreement or similar.
The use of this Standard by other companies / organizations / government agencies and individuals is the sole responsibility of the users.."

CONTEC
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SC - 13
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Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard N-1. For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

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Foreword

This Standard is the English version (issued in 11/2015) of PETROBRAS N-2200 REV. F 08/2015, including its Amendment - 11/2015. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

1 Scope

1.1 This Standard establishes conditions required for several types of signs and markers for pipelines, pipeline right-of-ways and restricted access areas of onshore production facilities, aiming to readily identify, to prevent undesirable events and to warn of risks associated.

1.2 This Standard also establishes the signage for pipelines without right-of-way.

1.3 This Standard is applicable to aboveground signage. ABNT NBR 15280-2 shall be consulted for buried signage.

1.4 This Standard is according to Technical Regulation ANP nº 2/2011.

1.5 This Standard is applicable to designs started after its date of issuance as well as to existing pipeline facilities, whenever repair or replacement is necessary during sign or marker maintenance.

1.6 This Standard contains Technical Requirements and Recommended Practices.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

Regulamento Técnico ANP nº 2/2011- Regulamento Técnico de Dutos Terrestres para Movimentação de Petróleo, Derivados e Gás Natural - RTDT;

PETROBRAS N-1219 - Colors;

PETROBRAS N-1550 – Metallic Structure Painting;

PETROBRAS N-2677 - Polyurethane Acrylic Paint;

PETROBRAS N-2726 – Terminologia de Dutos;

PETROBRAS - Caderno de Assinaturas;

Manual de Sinalização da PETROBRAS - Unidades Industriais;

ABNT NBR 7276 - Sinalização de Advertência em Linhas Aéreas de Transmissão de Energia Elétrica;

ABNT NBR 15280-2 - Dutos Terrestres Parte 2: Construção e Montagem.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

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3 Terms and Definitions

The terms and definitions of PETROBRAS N-2726 are adopted for this document purposes.

3.1
lateral
pipeline that branches off of the main line

3.2
right-of-way sections
right-of-way length comprised between two relevant points such as: hubs, laterals, crossings, junctions, route variations, intermediate stations, delivery points or other relevant point

3.3
route variation
route section that starts and ends on main route

4 General Conditions

4.1 Right-of-ways and restricted access areas of onshore production facilities shall be identified and marked with markers and signs according to the standard figures of Annex A.

4.2 Colors to be used on markers and signs shall meet PETROBRAS N-1219 mentioned beneath:

a) black - 0010;
b) yellow - 2386;
c) white - 0095;
d) green - 3355;
e) red - 1547.

4.3 Markers shall be painted with acrylic paint according to PETROBRAS N-2677, in colors indicated in the standard figures in Annex A.1.1, A.1.2; A.2, A.3.1; A.3.2 and A.4.

4.4 All signs, supports and other metallic parts shall have their surface prepared according to PETROBRAS N-1550, in colors indicated in the Figures A.5 and A.6.

4.5 The PETROBRAS Trademark Identity System of shall be consulted for the use of PETROBRAS trademark or of its subsidiaries, considering the color version.

4.6 The PETROBRAS trademark should be replaced by subsidiary trademark for the signage of subsidiaries facilities of PETROBRAS system. **[Recommended Practice]**

4.7 A specific signage design may be performed for flooded areas right-of-ways (swampy areas,Amazonia and others), in high growth cultivation areas (sugar cane plantation, banana groves and others), in urban areas or in areas that need special signage, attending, where applicable, the requirements of this Standard.

4.8 This Standard does not restrict the use of alternative materials to carbon steel for sign fabrication and concrete for markers fabrication, inasmuch as all requirements are met. Alternative materials shall be proved adequate to the considered application and their use is department user's responsibility. Signs or markers fabrication with alternative material shall have specific design.

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4.9 Markers and signs shall meet, whenever applicable, the restrictions imposed by public space regulation.

4.10 The warning aerial signage at crossings of transmission lines and pipeline right-of-ways shall be according to ABNT NBR 7276.

4.11 Two fabrication alternatives, solid section (Figure A.1.1 and A.3.1) and hollow section (Figure A.1.2 and A.3.2), are presented for right-of-way marker (Figure A.1) and line marker (Figure A.3).

4.12 A concrete slab size 750 mm x 750 mm x 50 mm thick shall be constructed around marker base, for better aerial visualization **[Recommended Practice]**.

5 Specific Conditions

5.1 Markers

5.1.1 Right-of-Way Markers

5.1.1.1 Pairs of markers shall be placed on right-of-way boundaries, for identification purpose, according to Figure A.1, in accordance with the following criteria:

a) at any point on the boundary of the right-of-way, the first posterior marker and the first anterior one shall be visualized, as being the sighting projection over this boundary or inside the right-of-way
b) horizontal points of inflection of right-of-way;
c) the maximum spacing between markers shall be 200 m for rural areas and 50 m for urban areas;
d) markers shall be placed in pairs on both banks of crossings and water crossings;
e) at the both ends of surrounding industrial areas.

5.1.1.2 The same criteria of 5.1.1.1 shall be used to identify the boundaries of anode bed right-of-ways. Markers shall be placed at cable ends and points of inflection of anode beds.

5.1.2 Aerial Patrol Markers

Aerial patrol markers shall be placed every right-of-way kilometer (slope distance), according to Figure A.2.

5.1.3 Line Markers

Line markers shall be placed over pipelines and communication cables route, according to Figure A.3, in accordance with the following criteria:

a) beside the margins of the crossings (highways, railways, municipal roads, access roads and field roads);
b) crossings of other pipelines, electric or communication cables;
c) beside the water crossing banks (rivers, lakes, dams, canals and streams submitted to dredge);
d) at the both ends of surrounding industrial areas.

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5.2 Signs

Type I, Type II or Type III Signs shall be placed according to standard Figures of Annex A.

Type I Sign shall be used with the same criteria of Type II Sign, when it is necessary to highlight the text or increase the font size.

5.2.1 Signs

5.2.1.1 Crossing of roads, streets and railways (Type I or II).

EXAMPLE

WARNING **BURIED PIPELINE(S)** **DO NOT EXCAVATE**

5.2.1.2 Crossing of roads and streets with possibility of motor vehicles access to right-of-way (Type I or II).

EXAMPLE

WARNING **BURIED PIPELINE (S)** **DO NOT EXCAVATE** **DO NOT DRIVE VEHICLES** **OVER THE RIGHT-OF-WAY**

5.2.1.3 Crossing of other pipelines or cables (Type I or II), such as:

EXAMPLE

WARNING **CROSSING** **8”OIL PIPELINE / 10 kV CABLE**

NOTE The sign can be fixed to an existing structure in urban areas, as an alternative, meeting the local public body standards. **[Recommended Practice]**

5.2.1.4 Water crossings of non-navigable rivers, canals and lakes, on both banks (Type I or II).

EXAMPLE

WARNING **SUBMERGED PIPELINE (S)** **DO NOT DREDGE**

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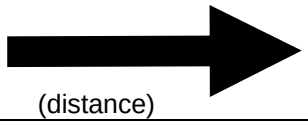
5.2.1.5 Water crossings of navigable rivers, canals and lakes (Type III): signs shall be placed according to Figures A.6.1 and A.6.2 on both banks, including the following message.

EXAMPLE

WARNING **SUBMERGED PIPELINE (S)** **DO NOT DREDGE** **DO NOT ANCHOR**

5.2.1.6 Access to valve sites, pig trap, pipeline right-of-ways, rectifiers or drainage stations, intermediate pumping or compression stations, internal corrosion monitoring stations and so on (Type I or II).

EXAMPLE

VALVE TAG **PIPELINE NAME**  (distance)

5.2.1.7 Anode beds (Type I or II).

EXAMPLE

WARNING **ANODE BED** **DO NOT EXCAVATE**

5.2.2 Identification Signs

5.2.2.1 Mainline Valve Sites, (Type I or II).

EXAMPLE

MAINLINE VALVE SITE **Valve Tag.....** **(PIPELINE NAME)**

5.2.2.2 Pig trap area (Type I or II).

EXAMPLE

PIG TRAP AREA **(PIPELINE NAME)**

NOTE Optionally, the sign can be directly fixed on protection fence of the area. **[Recommended Practice]**

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5.2.2.3 Pipeline right-of-way

At the beginning of right-of-way and where there are changes on right-of-way section, with the information duly modified (Type I or II).

EXAMPLE

RIGHT-OF-WAY - AAAA **km XX** **RIGHT-OF-WAY PIPELINES:** **- PIPELINE XXXX** **- PIPELINE YYYY** **- OPTICAL FIBER CABLE**

5.2.2.4 Lateral/Route Variation

Junction point between main pipeline and lateral/route variation (Type I or II)

EXAMPLE

LATERAL/ROUTE VARIATION - BBBB **LENGTH - XX km** **Km XX OF RIGHT-OF-WAY AAAA** **PIPELINES INCLUDED ON** **LATERAL/ROUTE VARIATION:** **- PIPELINE ZZZZ**

5.2.2.5 Production, compression and pumping stations, among others, placed beside facility main entrance gate, next to the fence (Type III).

EXAMPLE

COMPRESSION STATION **MIRANGA FIELD**

5.2.2.6 Restricted access area (Type I and II).

EXAMPLE

PETROBRAS PROPERTY AREA

5.2.3 Warning Signs

5.2.3.1 Mainline valve sites, pig traps and other facilities (Type I or II).

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