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TECHNICAL SPECIFICATION FOR CNG INSTALLATION WORKSHOPS TECHNICAL APPROVAL CERTIFICATION

ENARGAS

ENTE NACIONAL REGULADOR DEL GAS

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TECHNICAL SPECIFICATION FOR CNG INSTALLATION WORKSHOPS TECHNICAL APPROVAL CERTIFICATION

1 PURPOSE

To set out basic guidelines, which a CNG Installation Workshop shall comply with so as to be accredited as being technically capable of performing the operations of CNG Fuel System installation, inspection, modification, dismounting or withdrawal, according to regulations in force.

2 SCOPE

This specification shall apply to those Individuals or Legal Entities involved in the CNG system defined in Resolution ENARGAS Nº 139/95, which was supplemented by Resolution ENARGAS Nº 2603/02 (or those superseding them in the future), herein indicated.

3 DEFINITIONS AND ABBREVIATIONS

For the purpose of this document, it shall be understood as:

3.1 Withdrawal

Dismounting of **CNG Fuel System** or any of its components when they are not suitable for use.

3.2 CNG Installation Workshop Technical Approval Certificate (Technical Approval Certificate)

A document issued by a **Certification Organization**, which is biennially updated and which testifies that the **CNG Installation Workshop** complies with the requirements stipulated by this Technical Specification.

3.3 Conversion

Type of operation that consists of **CNG Fuel System** installation and authorization**.**

3.4 Dismounting

Type of operation that consists of removing from a motor vehicle the **CNG Fuel System** or any of its components so as to **withdraw** them when they are not suitable for use, or they may be reinstalled in another motor vehicle -with the limitations established in B.5 of Resolution ENARGAS Nº 2603- having previously verified their safety, efficiency and traceability capability.

3.5 CNG Fuel System (Fuel System)

Set approved by a **Certification Organization** to a **CNG Fuel System Supplier** for its installation in motor vehicles using natural gas in their propulsion system. It consists of the following components, approved by a **Certification Organization**:

a) cylinders;
b) cylinders´ fastening devices;
c) manual valves to be installed in cylinders outlets, including their safety systems;
d) high pressure tubing and its fastening device;
e) connector for high pressure tubing;
f) pressure regulator and its fastening device;
g) CNG filling valve and its fastening device;
h) mixer;
i) solenoid valves;
j) fuel selector switch and its electrical connections;
k) pressure gauge;
l) low pressure gas conduit; and
m) venting system.

3.6 Open fire

Any element that due to its mode of use or operation is capable of generating enough thermal energy so as to produce the ignition of natural gas and air mixture when this mixture contacts that element, enabling flame propagation outside such element.

3.7 Compressed Natural Gas (CNG)

Mixture of gaseous hydrocarbons mainly made up of methane, to be:

a) used in motor vehicles as fuel, stored inside a cylinder at a maximum pressure of 200 bar G at 15 ºC ± 1 ºC, and
b) stored in CNG Filling Stations at a maximum pressure of 250 bar G at 15 ºC ± 1 ºC, to be subsequently filled in motor vehicles, according to the conditions defined in a).

3.8 Modification

Type of operation consisting of:

- The replacement of one or more CNG Fuel System components and its subsequent authorization, or
- The substitution of the qualifying identification sticker when it deteriorates or gets lost.

3.9 Operations

Listed in alphabetical order, they consist of one or more of the following activities:

- Withdrawal,
- Conversion,
- Dismounting,
- Modification,
- Inspection.

3.10 Certification Organization (CO)

Entity accredited by the ENARGAS, according to Resolution ENARGAS Nº 138/95 or one superseding it in the future.

3.11 CNG Fuel System Supplier (PEC)

A physical or legal person having civil, technical, economic and financial responsibility, according to ENARGAS judgment, which together with its Technical Representative, it is severally liable for:

- mounting the CNG Fuel System on motor vehicles and making it authorized by a Certification Organization.
- authorizing the operation and issuing the corresponding documentation according to the regulations in force.
- training **Installation Workshops** authorized by it; verifying the performance of **operations** according to what is stipulated by the regulations in force and in the manuals drafted by the PEC and approved by the **CO**, and verifying the validity of the TdM **Technical Approval Certificate**.

3.12 PEC Technical Representative (TR)

Engineer whose title enables him to act in this respect. He shall be registered at the pertinent Professional Association and enabled by a Distribution Licensee as first class gas specialist.

3.13 CNG Installation Workshop Responsible Technician (RTTdM)

Engineer or Technician whose title enables him to act in this respect. He shall be registered at the pertinent Professional Association and enabled by a Distribution Licensee as first class gas specialist.

3.14 Inspection

Type of operation consisting of the verification, through mandatory scheduled or circumstantial tests, according to regulations in force, of the necessary

conditions so as to consider the installation and operation of the installed **CNG Fuel System** safe and efficient, and its subsequent qualification for a year.

3.15 CNG Installation Workshop (TdM)

Physical or legal person having valid technical approval certification granted by a **CO**. It is contractually related to the PEC that has accredited and legally authorized it. It performs the **operations** according to the procedure and training received by the qualifying PEC, according to the regulations in force.

3.16 Abbreviations

- **ENARGAS:** Ente Nacional Regulador del Gas
- **CNG:** Compressed Natural Gas
- **CO:** Certification Organization
- **PEC:** CNG Fuel System Supplier
- **TR:** PEC Technical Representative
- **RTTdM:** TdM Responsible Technician
- **TdM:** CNG Installation Workshop

4 GENERAL ASPECTS

4.1 This document supplements regulations in force. In case of discrepancies, the criterion adopted in this document shall prevail.

4.2 The TdM shall have a valid technical approval accreditation or its renewal, issued by a CO, according to this document.

In order to comply with what is established in the previous paragraph, the TdM shall submit before the CO the documentation set forth by the Annex of this document.

4.3 The RTTdM shall:

4.3.1 be the valid interlocutor before the CO.

4.3.2 sign all the documentation generated during his management and in the subsequent verifications.

4.3.3 verify that the set of tasks defining each operation indicated in the “Purpose” of this document are complied with, according to the

procedure and training received by the PEC to whom he relates, and to the regulations in force.

4.3.4 verify that the TdM´s general maintenance is performed as per this document and to the training received by the PEC to whom he relates.

4.4 The CO shall verify that the TdM complies with what is established by this document —paying special attention to the guidelines detailed in point 5— through non-announced (at least two [2] per year) and scheduled (if deemed necessary and the quantity determined) audits.

The CO shall have a data base, recording for each accredited TdM, at least:

4.4.1 TdM´s code, valid accreditation due date, address, zip code, telephone number, fax number and e-mail (if any).

4.4.2 The RTTdM corresponding information (name and surname, professional degree, ID (DNI) number, number of registration in the Professional Association and of the registration of first category gas specialist.

4.4.3 The observations arisen from the analysis of the documentation submitted by the TdM and of the inspections performed, and the subsequent corrective actions taken by the TdM.

4.4.4 The registration of the RTTdM signature before that CO.

The CO shall also register those TdMs which:

4.4.5 have not being accredited, together with the reasons,

4.4.6 have not renewed its accreditation, and

4.4.7 have being removed from service, together with the reasons.

The CO shall include the new information related to points 4.4.1, 4.4.2, 4.4.5, 4.4.6 and 4.4.7 in the Website that ENARGAS shall create for that purpose. This Site shall be checked by the PEC before authorizing each operation so as to ascertain TdM validity.

4.5 The CO shall issue TWO (2) copies of the Technical Approval Certificate signed by the RTTdM: one for the TdM and the other one for the CO, at least, during its validity period. If the RTTdM is substituted, the CO shall issue a new certificate, keeping the given original validity, and shall notify PEC.

4.6 Together with the Technical Approval Certificate, the CO shall submit before the TdM the "PROOF OF CERTIFICATION" sign. This sign shall be removed by the CO in the cases indicated in points 4.4.6 and 4.4.7.

4.7 The TdM shall negotiate its authorization before the PEC with which it wants to work, submitting a copy of the Technical Approval Certificate together with any other requirements requested by such PEC, so as to generate the contractual relationship.

4.8 Once the PEC´s accreditation is obtained, the TdM shall place the "PROOF OF CERTIFICATION" sign at the front office, in such a way that it is visible to users, inspectors and auditors.

Besides, it shall add the authorization certificate granted by the qualifying PEC, together with the guidelines for motor vehicle inspection and the municipal authorization.

4.9 The TR shall act in his capacity in the area assigned by the corresponding PEC. Besides, he shall:

4.9.1 watch over the compliance of the standards issued on a particular matter.

4.9.2 make the necessary negotiations involving the compliance of the technical, efficient and safety aspects.

4.9.3 be the interlocutor before the companies to which the PEC relates, the Certification Organization and the ENARGAS.

5 BASIC CONTROL SCHEME FOR THE TECHNICAL APPROVAL CERTIFICATION

The CO shall verify the TdM´s compliance of, at least, the following guidelines, related to the shop and facilities conditions, the equipment, the personnel training, the control systems, the documentation that shall be in the shop possession and the minutes book.

5.1 Shop and facilities conditions

5.1.1 It shall be adequately maintained and shall be in a good hygienic condition. It shall have a place suitable for front office. Besides, it shall be supplied, at least, with a desk and a cabinet for storing documentation.

5.1.2 The minimum TdM surface shall not be lower than that indicated in 3.6.16.1.c) of Standard NAG-415 (former GE-N1-115), that establishes: “Do not supervise more than FIVE (5) motor vehicles in areas equivalent to 100 m^2.”

5.1.3 The following areas shall be perfectly demarcated:

5.1.3.1 Motor vehicles circulation area

5.1.3.2 Working area

5.1.3.3 Parking area (consisting of parking or garage for motor vehicles having CNG in their propulsion systems)

5.1.3.4 Gas venting area

5.1.3.5 Storage of Fuel System components area

5.1.3.6 Open Fires area

5.1.3.7 Tools storage area

5.1.3.8 Administrative management area

5.1.3.9 Commercial management area.

5.1.4 The parking area shall comply with what is stipulated by Standard NAG-419 (former GE-N1-119).

5.1.5 Ventilation shall be performed outward, through permanent openings. The total openings surface shall be, at least, 5% of the surface corresponding to the shop walls. The openings shall be conveniently distributed so as to guarantee a natural air flow.

The 80% of the openings surface shall be located in the upper part and the remaining 20% in the lower part. The latter shall be built in a safe area so as to avoid that a gas leak may affect people or goods´ safety. It shall also be constructed in such a way that it does not prevent the air from entering. The necessary means shall be implemented so that ventilation is not obstructed.

If it does not have natural ventilation, permanent mechanical ventilation shall be implemented, with air flow renewal not less than TWENTY (20) air volumes per hour, taking into account working areas, parking and venting. The fan engine protection mode shall be, at least, of increased safety type.

5.1.6 TdMs shall be naturally or artificially lighted with a minimum lighting service of 400 lux on the working plane for TdMs carrying out medium-sized works, according to what is set forth by Decree 351/79 of Law 19.587 “Occupational Health and Safety”.

5.1.7 The working area shall be built with fireproof materials.

5.1.8 They shall have tri class fire extinguishers for ABC fires, with extinguishing potential not less than 1A 10B (according to IRAM 3523 “POWDER FIRE EXTINGUISHERS. MANUALS”). The revision and the product shall not be expired.

They must be readily visible and accessible. They shall be placed at a distance not longer than 15 m from the fire extinguisher to any point of the shop (according to IRAM 3517-1 “Manual and wheeled fire extinguishers. Selection, installation and use”).

Decree 351/79 of Law 19587 “Occupational Health and Safety”, municipal provisions or any other regulation superseding them in the future shall be implemented.

5.1.9 Regulatory signs (NO SMOKING, CNG INSTALLATION AREA, CYLINDER STORAGE AREA, GUIDELINES FOR MOTOR VEHICLES INSPECTION and PROOF OF CERTIFICATION) shall be placed in readily visible places. They must be legible to users. The latter sign shall be placed near the shop access area.

Signs shall be made with materials suitable for their conservation.

“GUIDELINES FOR MOTOR VEHICLES INSPECTION” and “PROOF OF CERTIFICATION” signs must have black letters not higher than 10 mm. Background color must be yellow, corresponding to natural gas identification.

The “PROOF OF CERTIFICATION” sign must be rectangular and not less than 600 mm wide and 450 mm height. It must be clean, framed and protected from environmental conditions. It shall have, at least, the following information:

- CO isologotype, in the middle of the sign upper part.
- The following legend: “TECHNICAL APPROVAL CERTIFICATION” must be centered and under the isologotype.
- Under the following legend: “TECHNICAL APPROVAL CERTIFICATION”, there must be the following wording: “The (Indicate full name of the Certification Organization) certifies that the CNG Installation Workshop (Indicate holders´ name or TdM´s name), located at (Indicate TdM´s address) complies with what is stipulated by the ENARGAS Technical Specification NAG-E 408. This certificate is valid until the (Indicate the date in which the certificate is not longer valid)”.
- Under the wording, the following shall be added:
- Signature and print full name of CO responsible person.
- RTTdM name and surname.
- Address and telephone number of PECs to which he contractually related. TR name and surname.
- CO address, telephone number, contact person, e-mail and fax number.
- TdM code of identification.
- The following wording: “If you have any doubts as regards the Technical Approval Certification of this Installation Workshop, check out the Web page (Indicate the ENARGAS Website address, registering certified workshops)”.

The “PROOF OF CERTIFICATION” sign shall have the necessary safety systems so as to avoid its adulteration and falsification. Each CO shall submit before the ENARGAS a basic layout identifying the safety systems used to meet possible inspection or expert´s requirements.

5.1.10 It shall be located at a perfectly demarcated, ventilated and remote area, at not less than 3 m from open fires, where cylinders shall be correctly stored with their plugs or if they have or it is supposed they have gas under pressure; they shall be stored with a closed shut off valve.

5.1.11 In the area where CNG Fuel System is installed, inspected, modified or dismounted, there shall not be open fires. A special area shall be assigned with protection elements for each type of activity.

5.1.12 There shall be a cylinder discharge area, away, at least, 3 m from open fires. It shall be adequately ventilated so as to prevent natural gas from accumulating and causing an explosive mixture.

5.1.13 Gas exhaust system installation:

5.1.13.1 will send natural gas to a safe area, in all four points. It shall be remote and over any type of openings or open fires.

Venting top height shall not be less than 6 m, measured from ground level. It shall be, at least, at 2.5 m over TdM´s roof (from its roof external face).

Besides, in relation to own and surrounding buildings, it must comply with the following expression:

$h > H – D + 2.5$

where:

h = venting height (measured in meters).

H = own or surrounding buildings, whichever is higher (measured in meters).

D = horizontal distance to surrounding buildings (measured in meters).

5.1.13.2 It shall be designed to support maximum pressure.

5.1.13.3 It shall be duly braced or its fastening shall be guaranteed.

5.1.13.4 It shall be efficiently grounded.

5.1.13.5 It shall comply with the regulations in force in that respect, in its location area, if any.

Nevertheless, the above-mentioned requirements may be relaxed, if venting is always performed:

5.1.13.6 at a safe location, in open air;

5.1.13.7 with grounded cylinder; and

5.1.13.8 at not less than 3 m, horizontally measured from: a) any ignition source, b) any air inlet opening, c) land border.

5.1.14 It must comply with the applicable provisions of Law 19587 of Occupational Health and Safety, its regulatory and concurrent decrees, and those superseding or modifying them in the future. Particularly, noise levels shall not exceed the admissible ones, according to local provisions in force.

5.1.15 Internal electric installations shall comply with the provisions in force.

5.1.16 If in the shop, activities other than those related to CNG are carried out, they should be separated through fixed physical means.

5.2 Equipment

TdM shall have, at least, the following:

- Lift (preferably) or pit, if it is not prohibited by municipal regulations in force.
- Cylinder fastening device for mounting and dismounting its valve. It shall be efficiently grounded.
- Equipment for shut off valve removal (under pressure).
- Proper tools for threads´ cleaning.
- Controlled torque wrenches, with appropriate range to cover the required torque for all threaded joints, two units (one in use and the other for controlling purposes).
- Equipment for gas tightness pneumatic test with inert gas at 200 bar.
- Pressure gauge with the appropriate range for gas tightness pneumatic test in the high pressure part, class 1, annually contrasted and certified by a competent authority.
- Pressure gauge with the appropriate range for regulated pressure (low pressure) gas tightness pneumatic test, class 1, annually contrasted and certified by a competent authority.
- Natural gas leak detector.

- Protecting plugs suitable for the different types of approved CNG threads. The necessary quantity shall be supplied according to TdM operation volume.
- Devices for high pressure pipe bending and their connectors´ mounting.
- Equipment required by PEC to guarantee safe and efficient running of fuel injection motor vehicles.
- Various tools, necessary for CNG Fuel System installation on the vehicle.
- Suitable cabinet for tools storage.

5.3 Personnel training

TdM personnel performing the tasks specified in the definition of Operations, as well as those related to the IT system, the reception, the storage and dispatch from the storage area, the tracking of CNG Fuel System and its components, and those that may be determined by the ENARGAS, shall receive from PEC and its TR the necessary training so as to safely performing the activities, according to the standards.

Not only at the beginning of its activity, but also whenever technological evolution or a change in the installations deems it appropriate, the PEC through its TR shall perform personnel training related to the tasks indicated in the first paragraph so as to comply with the regulations.

Considering what was indicated in the previous paragraphs, the manuals and individual training certificates granted by PEC and its TR to TdM personnel shall be verified. Besides, course assistance certificates shall also be verified, whenever technological innovation or the training deems it convenient.

5.4 Control systems

It shall be verified that the documentation generated as a consequence of the following tasks has IT backup, or equivalent, necessary for its reproduction, so as to enable the monitoring of the process related to:

- Operations established by the Purpose of this document.
- Reception control.
- Stock in storage.
- Dispatch from the storage for its installation.

- Tracking of CNG Fuel System and its components.
- All the documentation related to Resolutions ENARGAS N° 139/95 and 2603/2002, as well as those established in the future by the ENARGAS.

A control system shall be provided in order to verify that CNG Fuel System and its components in TdM have the corresponding authorization granted by a CO.

In relation to CNG Fuel System used components to be installed, the compliance with what was stipulated by Resolution ENARGAS N° 2603/02 or with what ENARGAS may determine in the future shall be verified.

In consideration of what was mentioned in the previous two paragraphs, their origin shall be able to be verified by means of an invoice or receipts, where the components´ serial number must be stated, among other information.

5.5 Documentation that shall be in TdM´s possession:

- Applicable Standards and Resolutions issued by the ENARGAS, related to the subject matter.
- Procedure manual for the installation, inspection, modification, dismounting or withdrawal of CNG Fuel System, submitted by the PEC. It must include layouts of the different vehicle conversion types, with the particular recommendations that each motor vehicle type deems it appropriate.
- TdM maintenance and control program, and emergency plans, submitted by PEC.
- Operations Recording System, differentiated by PEC and by type of operation.
- Minutes book, book of PEC technical inspections and CO audits (see 5.6).

5.6 Minutes Book

CO shall provide a minutes book where PEC TR technical inspections and CO audits must be registered. It shall be foliated and signed by CO, at the technical approval certificate issuing. (Once its management finishes, this book will be in TdM´s possession and will be at auditors and inspectors´ disposal).

5.6.1 The minutes of PEC TR technical inspection shall state the date, the tasks performed during the inspection, TdM personnel taking part, observations and corrective actions that may arise; as well as the verification of compliance of previous indicated corrective actions.

5.6.2 In the CO audit minutes, the date, the tasks carried out during the audit, TdM personnel taking part, the observations and corrective actions that may arise and the terms for its execution shall be registered. Besides, the verification of compliance of corrective actions arisen from previous audits, the verification of PEC TR technical inspection as was indicated in 5.5.1 and the verification of the received training by TdM personnel shall also be registered.

6 ANNEX: TECHNICAL APPROVAL APPLICATION - DOCUMENTATION TO BE SUBMITTED BEFORE THE CERTIFICATION ORGANIZATION

1) Application note, which shall contain the following information:

    - Name or company´s name.
    - Company type, if any (S.R.L., S.A., etc.).
    - Single Tax Identification Number (CUIT).
    - Registered domicile.
    - Place of business.
    - Telephone number, fax number and e-mail address, if any.
    - Current, main and concerning activities.

2) Formal commitment of notifying the Certification Organization any modification made in the submitted information.
3) Company´s organization chart, indicating employers´ name and surname with their respective tasks, and the training received by PEC.
4) Authenticated copy of valid ownership deeds. In case of rental, an authenticated copy of valid lease agreement.
5) Authenticated copy of Municipal Authorization Certificate, which shall indicate the activities to be carried out. The proof of commencement of procedures as an authentication document is not accepted.
6) Authenticated copy of the Company´s Articles of Association and its modifications, if any.
7) Authenticated copy of the Company´s registration in the Superintendency of Corporations and its modifications, if necessary.
8) Authenticated copy of the corresponding tax registrations.
9) Information about the TdM Technical Representative:

9.1 Note indicating the following information:

- Name and surname.

- ID (DNI) number.
- Single Tax Identification Number (CUIT).
- Registered and actual domicile.
- Telephone number, fax number and e-mail address, if any.
- Professional registration number and the Professional Association that granted it (if any).
- Installer registration number and the Distribution Licensee that granted it.

9.2 Note as “Affidavit”, where the Technical Representative states being fully aware of the regulations in force governing the activity and having received training from the corresponding PEC.

9.3 Besides, the following documentation related to the Technical Representative shall be included:

- Photocopy of ID (DNI) number.
- Authenticated photocopy of professional degree.
- Proof of the professional field of such degree, granted by the Professional Association or the respective educational authority. It shall include performance of activities similar to those to be carried out.
- Photocopy of updated proof of payment of the registration in the Professional Association (if any).
- Proof issued by the respective Professional Association (if any), where it is proved that he is authorized to practice his profession.
- Photocopy of updated proof of payment of the registration “as first class gas installer”.
- First class installer authorization proof, issued by the Distribution Licensee at where he is registered.

9.4 Authenticated copy of the Technical Representative hiring of services by TdM.

10) Authenticated copy of the Contract entered into PEC and TdM, provided that the Technical Approval Certificate is issued.

11) Civil Liability Insurance, indicating the risks not covered in the Policy contracted by the respective PEC.

12) Pictures of the facilities dedicated to the operation (front, interior, front office).

13) Electrical installation drawing: main board, switches, power jacks and lighting devices that guarantee minimum lighting level of 400 lux on working planes.

14) Drawing indicating conversion area, with vehicles´ entrance and exit layout, pointing out the location of lifts, fire extinguishers, open fires, venting system and cylinder storage area so as to comply with applicable regulations in force, including the municipal ones.

If activities other than those related to CNG are being carried out in the shop, the drawing shall indicate their location and type of fixed physical means that must separate them.

15) TdM ventilation details.

16) Layout drawing illustrating the location of regulatory signs (NO SMOKING, CNG INSTALLATION AREA, CYLINDER STORAGE AREA, GUIDELINES FOR MOTOR VEHICLES INSPECTION, PROOF OF CERTIFICATION and MUNICIPAL AUTHORIZATION).

17) List of tools, instruments, equipment and devices for the tasks established by the Purpose of this document.

Form for proposals on the Technical Specification for CNG Installation Workshops Technical Approval Certificate		
Company:		Technical Representative:
Address:	Zip Code:	TE:
Page:	Point:	Paragraph:
Quote:		
Proposal:		
Substantiation for Proposal:		

Signature:

Type or print: **Page of**

Title:

INSTRUCTIONS FOR FILLING-IN THE FORM FOR PROPOSALS

1) Complete in print letters (hand written or printed), with indelible ink.
2) In the space identified as "**Quote**", copy the text you propose to modify or else summarize it as long as there are no doubts or ambiguities about the text it refers to.
3) In the space identified as "**Proposal**", indicate the exact wording to be inserted.
4) In the space identified as "**Substantiation for Proposal**", state the problem that it will be resolved or improved by your recommendation. Give the specific reason for your proposal including the technical bibliography on which it is grounded providing copies, if possible, or else describing the experience it is based on.
5) This Proposal must be submitted to the Distribution Management of the ENTE REGULADOR DEL GAS (ENARGAS) Suipacha 636 4° Piso, (1008), City of Buenos Aires.