

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

CHANGE CONTROL

SECTION	DESCRIPTION
1.1	Description updated
1.2	Description updated
2.1	Description updated
4.1	Description updated
5.2	Piping requirements updated
5.5	Structural and civil requirements updated
6.0	Scope updated
10.1	Scope description

INSPECTION REQUIREMENTS:

Criticality level: CRITICAL
Inspection required: YES
Inspection level: 2
Special Inspection Requirements: NO

CONFIDENTIALITY

THIS DOCUMENT IS THE PROPERTY OF "REFINERÍA DE CARTAGENA". IT MAY CONTAIN INFORMATION DESCRIBING TECHNOLOGY OWNED BY LUMMUS TECHNOLOGY AND / OR "REFINERÍA DE CARTAGENA" AND DEEMED TO BE COMMERCIAL SENSITIVE. IT IS TO BE USED EXCLUSIVELY FOR THE PURPOSE IT IS INTENDED AND SHALL BE RETURNED TO ITS OWNER UPON REQUEST. REPRODUCTION IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN WORK PERFORMED BY "REFINERÍA DE CARTAGENA" IS NOT ALLOWED. IT IS TO BE SAFEGUARDED AGAINST BOTH DELIBERATE AND INADVERTENT DISCLOSURE TO ANY THIRD PARTY. IDOM IS NOT RESPONSIBLE FOR NON-AUTHORIZED DISCLOSURE OF THIS DOCUMENT.

REVIEWS:

2	ISSUED FOR PURCHASE - UPDATED WHERE INDICATED				12/04/2024
		RPM	DCJ	JVA	
1	ISSUED FOR PURCHASE - UPDATED WHERE INDICATED				28/02/2024
		RPM	OVM	JVA	
0	ISSUED FOR PURCHASE				18/12/2023
		RPM	OVM	JHR	
A	ISSUED FOR COMMENTS				15/12/2023
		RPM	OVM	JHR	
REV.	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY	FECHA

EDP-F-046 – 20/11/2017 V-1
Documento Rector: EDP-G-009

1/23

Todos los derechos reservados para Ecopetrol S.A. Ninguna reproducción externa copia o transmisión digital de esta publicación puede ser hecha sin permiso escrito. Ningún párrafo de esta publicación puede ser reproducido, copiado o transmitido digitalmente sin un consentimiento escrito o de acuerdo con las leyes que regulan los derechos de autor y con base en la regulación vigente.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

TABLA DE CONTENIDO

	Página
1. INTRODUCTION	4
1.1. GENERAL CONDITIONS	4
1.2. GLOSSARY	4
1.3. ORDER OF PRECEDENCE	5
2. SCOPE OF SUPPLY	5
2.1. GENERAL SCOPE	5
2.2. EXCLUSIONS.....	6
2.3. SUPPLY OPTIONS.....	6
3. RESPONSIBILITY	6
4. GENERAL REQUIREMENTS	7
4.1. GENERAL	7
4.2. ALTERNATIVE PROPOSALS.....	7
4.3. REQUIRED DOCUMENTATION WITH THE OFFER	7
4.4. REQUIRED DOCUMENTATION AFTER THE PURCHASE ORDER	7
4.5. RELIABILITY REQUIREMENTS	10
4.6. APPROVED BRANDS BY ECOPETROL	10
4.7. APPROVED SUPPLIERS OF ECOPETROL	11
4.8. REUNIONES DE INGENIERÍA Y VISITAS.....	11
4.9. ASSISTANCE ON SITE.....	11
4.10. TRAINING.....	12
4.11. SPARES	12
4.12. SPECIAL TOOLS	12
4.13. DOCUMENTATION	12
5. TECHNICAL REQUIREMENTS	13
5.1. MECHANICAL REQUIREMENTS	13
5.2. PIPING REQUERIMENTS	13
5.3. ELECTRICAL REQUIREMENTS.....	13

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

5.4.	INSTRUMENTATION AND CONTROL REQUIREMENTS	14
5.5.	STRUCTURAL AND CIVIL REQUIREMENTS	14
5.6.	OTHER REQUIREMENTS.....	14
5.7.	PRE-ASSEMBLY REQUIREMENTS.....	14
5.8.	PRE-COMMISSIONING AND COMMISSIONING REQUIREMENTS	14
6.	PRESERVATION, PACKAGING, MARKING, LIFTING AND TRANSPORTATION	15
7.	QA AND INSPECTION REQUIREMENTS.....	16
7.1.	QUALITY MANAGEMENT SYSTEM (QMS)	16
7.2.	CRITICITY LEVEL AND INSPECTION LEVEL	16
7.3.	INSPECTION AND TEST PLAN (ITP).....	17
8.	REQUIREMENTS IN HEALTH, SAFETY AND ENVIRONMENT (HSE).....	18
9.	TECHNICAL GUARANTEES	18
10.	ANNEXES	19
10.1.	SCOPE LIST	19
10.2.	REFERENCE STANDARDS.....	22
10.3.	REFERENCE DOCUMENTS	22

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

1. INTRODUCTION

2

1.1. GENERAL CONDITIONS

This requisition covers the supply and installation of parts and accessories for the revamp of four (4) existing heat exchanger identified as: CNT-107-E-101-A, CNT-107-E-101-B, CNT-107-E-201-A and CNT-107-E-201-B for the Project "INGENIERIA BÁSICA PAR EL PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE" at Cartagena's Refinery located in the industrial locality of the city, Cartagena de Indias, DT and C, department of Bolivar, Colombia.

The parts and accessories for the heat exchangers revamp shall include all elements, materials and consumables required and sufficient to ensure the equipment performance, functional and operative under the process conditions indicated in the documents shown in Section 10.3 and must comply with the regulations, codes and rules in force at the regional, national and international agreements indicated in this requisition and other applicable ones.

2

1.2. GLOSSARY

CLIENT: ECOPETROL, Refinería de Cartagena – REFICAR. Owner of the project and who finally pays for its design and construction. CLIENT will generally specify the technical requirements. CLIENT can also include an authorized agent or consultant to act on behalf of the CLIENT.

REVAMP PARTS: Elements, materials, consumables and all necessary parts to modify and ensure the equipment performance, functional and operative under all process conditions indicated in data sheets showed in Section 10.3.

REVAMP PARTS SUPPLIER: The party that manufactures and/or supplies REVAMP PARTS for de correct operation of heat exchangers.

SITE: It will mean the facilities and places where the project will be executed or carried out, in this case it is the Cartagena refinery REFICAR, located in the industrial locality of the city, Cartagena de Indias, DT and C, department of Bolivar, Colombia.

CONTRACTOR: The part that is assigned to perform the heat exchangers modifications and install all the new components for the heat exchanger in field.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

1.3. ORDER OF PRECEDENCE

Should any conflict or ambiguity arise between the applicable local laws, regulations, standards and international codes, the following order of precedence shall apply, unless otherwise indicated:

1. Local legal and governmental laws and regulations.
2. Codes and industrial standards.
3. Data sheets and P&IDs last version issued.
4. This Material Requisition las version issued.
5. CLIENT technical Specification and its annexed documents.
6. Purchase Order.

In the case of any conflict between the requirements of this requisition and any referenced documents forming part of the requisition, the REVAMP PARTS SUPPLIER shall highlight this conflict to the CLIENT for resolution, which must be resolved in the KOM (Initial Meeting), when applicable.

2. SCOPE OF SUPPLY



2.1. GENERAL SCOPE

The general list of the equipment and/or components object of this requisition of materials is described below. The particular list of components is indicated in the section "10.1 Scope list".

Item	Quantity	Units	TAG	Description	ECOPETROL Catalog Code
1	1	Global	CNT-107-E-101 A and CNT-107-E-101 B	Revamp engineering (Mechanical, hydraulic and thermal design) and supply of REVAMP PARTS for two (2) heat exchanger in a series installation. The heat exchangers are BEU type. Currently designs for a duty 19.17 MMBtu/hr and shall be modified to comply with all design cases indicated in the data sheet 107-DS-ME01-0307 last version issued.	N/A

	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

2	1	Global	CNT-107-E-201 A and CNT-107-E-201 B	Revamp engineering (Mechanical, hydraulic and thermal design and supply of REVAMP PARTS for two (2) heat exchanger in a series installation. The heat exchangers are BEU type. Currently designs for a duty 25.29.17 MMBtu/hr and shall be modified to comply with all design cases indicated in the data sheet 107-DS-ME01-0308 last version issued.	N/A
---	---	--------	-------------------------------------	---	-----

2.2. EXCLUSIONS

The following items are excluded from the REVAMP PART'S SUPPLIER scope of supply:

- Heat exchangers integrity evaluation.
- Additional supports for inlet piping.
- Heat Exchanger saddle modifications if required.
- Field erecting and dismantling works.
- Supply and installation of thermal insulation

2.3. SUPPLY OPTIONS

N/A.

3. RESPONSIBILITY

It is within the REVAMP PARTS SUPPLIER scope of supply the planning and programming of manufacture, design, supply of parts and materials, manufacturing in the workshop, testing, inspection, control and quality assurance, supply of technical documentation and certificates, packaging / packing, storage and preparation for shipment, inspections and test, guarantees and others included and indicated in this requisition and the attached documents.

The REVAMP PARTS SUPPLIER shall guarantee the performance for duty requirements, thermal, hydraulic and mechanical restriction as per Revamp Data Sheet in the attached documents (**10.3**) with this requisition.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

4. GENERAL REQUIREMENTS

2

4.1. GENERAL

The REVAMP PARTS for 107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A and 107-CNT-E-201 B, shall be supplied and guaranteed as a complete package unit by a single source of supply. The unit shall be supplied with all accessories and appurtenances necessary for their satisfactory operation, including, but not limited to the following:

- Revamp engineering (Mechanical, hydraulic and thermal design) and supply of REVAMP PARTS (Front Head and tube bundle (tubesheet, tubes, baffles, tube support, impingement plate, sliding bars, sealing bars, and all necessary parts for tube bundle)) for 107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A and 107-CNT-E-201 B, designed in accordance with standard 000-SP-ME07-0005 – Shell And Tube Heat Exchanger Specification, 000-SP-ME07-0006 Heat Exchanger Material Specification, 000-SP-PR07-0023 Shell & Tube Heat Exchangers Process Design Standard, 000-SP-MV09-0004 Pressure Vessel Requirements For Wet Hydrogen Sulfide (H₂S) Service Specification, 107-DS-ME01-0307 "Hoja de datos modificaciones Intercambiador de Calor E-101 A/B", 107-DS-ME01-0308 "Hoja de datos modificaciones Intercambiador de Calor E-201 A/B" and all documents that accompanies this requisition.

4.2. ALTERNATIVE PROPOSALS

The REVAMP PARTS SUPPLIER shall consider that any alternative proposal must be presented to the CLIENT and/or its representative for the respective analysis and feasibility of the proposal.

The alternative proposal shall be of equal or superior quality than the main proposal. Alternatives that reduce mechanical integrity and do not comply with the criterion of useful life will not be accepted as valid.

4.3. REQUIRED DOCUMENTATION WITH THE OFFER

The required documentation with the offer is indicated in numeral 4.4.

4.4. REQUIRED DOCUMENTATION AFTER THE PURCHASE ORDER

The documents that must be delivered by the INTERNALS SUPPLIER are presented below:

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

DESCRIPTION	WITH OFFER	FIRST ISSUE AFTER THE PURCHASE ORDER			FINAL ISSUE (5)
		DATE OF ISSUE (2)	PURPOSE (3)	QUANTITY TYPE (4)	QUANTITY TYPE (4)
REVAMP PARTS SUPPLIER description. Including experience regarding the revamp proposed.	X	+2W	IFR	E	-
List of comments, deviations and exceptions to this request and its annexes, without this information proposal will be rejected.	X	+0D	IFR	E	-
Revamp Engineering, acquisition, manufacturing and testing schedule.	X	+2W	IFR	E	-
Quality plan and quality system certification	X	+2W	IFR	-	E
Sub-supplier and list of major suppliers	X	+2W	IFR	E	E
Qualification of sub-suppliers		+4W	IFR	E	E
List of documents and drawings of the SUPPLIER.	X	+2W	IFR	E	-
Drawings of general arrangement with weights, dimensions, list of parts and materials, center of gravity, including loads applies on saddles (*)		+3W	IFR	E	E
Detailed drawings of the components with weights, dimensions, lists of parts and materials		+4W	IFR	E	E
TEMA Data sheets developed by SUPPLIER (*)		+2W	IFR	E	E
Thermal and mechanical calculation report for all design cases		+ 5W	IFR	E	E
Drawings of internal elements supports (if apply)		+4W	IFR	E	E
Name plate drawings updated according to new process conditions		+4W	IFR	E	E
Permissible loads for nozzles		+2 W	IFR	E	E
Welding map		+4W	IFR	E	E
List of parts and spare parts for installation and start up including prices (if apply).	X	+4W	IFR	E	E
List of parts and spare parts for two (2) years of operation including prices (if apply)	X	+4W	IFR	E	E
Inspection and Test Plan – ITP		+3W	IFR	E	E
Welding procedure and qualification WPS, PQR		+2W	IFR	E	E
Non-destructive testing procedure		+2W	IFR	E	E
NDE Reports and qualifications		- 2W	IFR	E	E

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

DESCRIPTION	WITH OFFER	FIRST ISSUE AFTER THE PURCHASE ORDER			FINAL ISSUE (5)
		DATE OF ISSUE (2)	PURPOSE (3)	QUANTITY TYPE (4)	QUANTITY TYPE (4)
Procedure and specification of paint and surface preparation		+2W	IFR	E	E
Packaging / packing, shipping and storage procedure		-4W	IFR	E	E
Positive Material Identification PMI		+4W	IFR	E	E
Material traceability records.		+4W	IFR	E	E
Inspection reports. (7)		2W AFTER TEST	IFR	E	E
Hydrostatic test certificate (7) (if apply)		-4W	IFR	E	E
Heat treatment record (7)		-4W	IFR	E	E
Dimensional report (7)		-4W	IFR	E	E
Certificate of results FAT tests (7)		-4W	IFR	E	E
Installation, assembly and start-up manuals (if apply)		-2W	IFR	E	E
Coating specification		+2W	IFR	E	E
Pre-commissioning/commissioning procedure (If apply)		-2W	IFR	E	E
Operation and maintenance manual (If apply)		-2W	IFR	E	E
Index of the final dossier of the SUPPLIER (Vendor data book index)		+8W	IFR	E	E
Final dossier of the SUPPLIER (Vendor data book (VDB))		-2W	IFR	E	E
Manufacturing and quality control dossier (6)		-2W	IFR	E	E
Delivery terms	X	-	IFR	E	E
Warranty	X	-	-	-	E
Progress report		Every 2W	IFR	E	E
Packing list		-2W	IFR	E	E

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

DESCRIPTION	WITH OFFER	FIRST ISSUE AFTER THE PURSHASE ORDER			FINAL ISSUE (5)
		DATE OF ISSUE (2)	PURPOSE (3)	QUANTITY TYPE (4)	QUANTITY TYPE (4)
NOTES					
(1) (*) PRIORITY DOCUMENTS SUBJECT TO PENALTY OR TERMS OF PAYMENT.					
(2) DATE OF ISSUE: "+" means Days (D) or Weeks (W) or Months (M) after the effective date of the purchase order. "-" means Days (D) or Weeks (W) or Months (M) before the effective date of dispatch.					
(3) PURPOSE: IFR = Issued for review and comments / INFO = Issued for information					
(4) QUANTITY TYPE: Number of printed copies (P) plus electronic copies (E)					
(5) FINAL ISSUE: Document without comments (with document status = 3)					
(6) BOOK OF INSPECTION CERTIFICATES: An additional copy will be delivered together with the products and will be indicated in the list of related Packaging.					
(7) Date of issue shall be agreed during the Kick Off Meeting (KOM).					

4.5. RELIABILITY REQUIREMENTS

The REVAMP PARTS SUPPLIER shall have representation in Colombia and after-sales service for on-site assistance requirements during installation and start-up, and maintenance requirements or parts requests.

The REVAMP PARTS SUPPLIER must indicate the components guarantees in the offer and deliver them with the components delivery.

All reliability requirements shall be aligned and in full accordance with the technical specifications referenced in this document.

4.6. APPROVED BRANDS BY ECOPETROL

Apply approved brands of ECOPETROL: According EDP-P-013 "Anexo 1: Procedimiento de Gestión para Homologación de Marcas – Listado de Marcas Homologadas" last edition.

Approved brands of ECOPETROL category: According EDP-P-013 "Anexo 1: Procedimiento de Gestión para Homologación de Marcas – Listado de Marcas Homologadas" last edition.

The approved brands will be updated and will be delivered with the offer request.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

4.7. APPROVED SUPPLIERS OF ECOPETROL

Apply approved suppliers of ECOPETROL: YES – 166000-000-PL-PT03-0001 APPROVED MANUFACTURES LIST FOR THE CARTAGENA REFINERY EXPANSION PROJECT.

Approved suppliers of ECOPETROL category: 1.1 Heat Exchangers Carbon Steel And Stainless Steel, Up To 40 Inch ID.

4.8. REUNIONES DE INGENIERÍA Y VISITAS

Item	Quantity	Purpose of the meeting or visit	Site
1	1	KOM	CLIENT OFFICES
2	1	Pre-Inspection meeting	CLIENT OFFICES
3	1	Unspecified "in pgress" surveillance visits (QA) visit the workshop	Factory
4	1	Final inspection on factory before shipment	Factory
5	1	Whichever other indicated in the KOM	CLIENT OFFICES

The number and the site of meetings will be confirmed during the KOM.

4.9. ASSISTANCE ON SITE

The REVAMP PARTS SUPPLIER shall offer in a separate item on-site assistance to:

- Assistance on site during the dismantling of replaced front head and tube bundles of heat exchangers.
- Pre-commissioning and commissioning.
- Start-up.
- Performance testing.

The proposal must consider the supply of a FIELD SERVICE TECHNICIAN, trained technically, for the associated tasks. The CLIENT will execute the activities of dismantling, erection, pre-commissioning, commissioning and start up, under the supervision of the FIELD SERVICE. The price of these services shall be included in the offer.

It is required to submit a program with activities description and organizational chart of the technical and management personnel that will be used for the execution of the assistance on site.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

Upon completion of the installation, SUPPLIER is required to assist and supervise the CLIENT in carrying out all required tests in order to determine the proper functioning and general performance of the heat exchangers. SUPPLIER shall ensure that the heat exchanger performance is as per revamp data sheet attached to this material requisition. SUPPLIER shall identify any special requirements or recommendations and make at his own cost, any adjustments and changes required, in order to obtain an efficient and fully operational installation.

SUPPLIER shall also provide necessary assistance to the CLIENT for precommissioning and commissioning technical preparation activities.

4.10. TRAINING

N/A

4.11. SPARES

The REVAMP PARTS SUPPLIER shall provide the required spare parts and consumables for the start-up. SUPPLIER shall present in a separate item a list with the bid the necessary spare parts for the start-up. As minimum the following shall be supplied:

- Two spare sets of gaskets per heat exchanger unit plus 10% spare bolts/nuts per unit.

The REVAMP PARTS SUPPLIER shall present in a separate item a list with the necessary spare parts for the correct operation of the supplied global unit during two (2) years of operation, as considered and applied.

4.12. SPECIAL TOOLS

The REVAMP PARTS SUPPLIER must indicate or provide as part of the requisition for the operation and maintenance of the revamp components, a list of special tools.

4.13. DOCUMENTATION

The documentation that the REVAMP PARTS SUPPLIER must provide and the deadlines for delivering the documentation are indicated in section 4.4.

Documentation is accepted in English and / or Spanish, except for operating and maintenance instructions which must be included in Spanish.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

5. TECHNICAL REQUIREMENTS

The REVAMP PARTS SUPPLIER must consider the following technical requirements:

5.1. MECHANICAL REQUIREMENTS

All mechanical requirements shall be in accordance with the following standards:

107-DS-ME01-0307	Hoja de datos modificaciones intercambiador de calor E-101 A/B
107-DS-ME01-0308	Hoja de datos modificaciones intercambiador de calor E-201 A/B
000-SP-ME07-0005	Shell And Tube Heat Exchanger Specification
000-SP-ME07-0006	Heat Exchanger Material Specifications
000-SP-MU10-0015	Equipment Nozzle Loads Specification
000-SP-MV09-0001	Pressure Vessel Specification
000-SP-MV09-0004	Pressure Vessel Requirements For Wet Hydrogen Sulfide (H2S) Service Specification
000-SP-MV09-0007	SA 263 Clad Plate Material Specification
000-SP-MU10-0004	Insulation Materials And Application – Hot Service
000-SP-MU10-0001	General Welding and Inspection Requirements
000-SP-MU10-0017	Coating Specification
000-SP-PR07-0023	Shell & Tube Heat Exchangers Process Design Standard

REVAMP PART SUPPLIER shall design the heat exchangers modifications to ensure the satisfactory operation for all design cases shown on revamp data sheets 107-DS-ME01-0307 "Hoja de datos modificaciones intercambiador de calor E-101 A/B" and 107-DS-ME01-0308 "Hoja de datos modificaciones intercambiador de calor E-201 A/B".



5.2. PIPING REQUIREMENTS

All piping requirements according to CLIENT piping class, indicated in P&IDs 107-DG-PR05-0006 and 107-DG-PR05-0021.

107-SP-PI02-0302	Piping Class
------------------	--------------

5.3. ELECTRICAL REQUIREMENTS

N/A.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

5.4. INSTRUMENTATION AND CONTROL REQUIREMENTS

N/A

2 5.5. STRUCTURAL AND CIVIL REQUIREMENTS

REVAMP PARTS SUPPLIER shall provide the new saddles reaction according to new weights. New reactions also include wind and seismic loads according UBC-1997 and NSR-10.

5.6. OTHER REQUIREMENTS

N/A.

5.7. PRE-ASSEMBLY REQUIREMENTS

The REVAMP PARTS for 107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A and 107-CNT-E-201 B shall be suitably marked with a clear and unique identifier which is cross-referenced on the REVAMP PARTS SUPPLIER assembly drawings and installation instructions. Interchangeable components shall have identical marks.

Pre-assembly extension shall be clarified at the Kick-Off Meeting (KOM).

5.8. PRE-COMMISSIONING AND COMMISSIONING REQUIREMENTS

The scope of supply includes all the tests indicated in the attached data sheets/ITP and the respective certificates.

The REVAMP PARTS SUPPLIER must provide the certificates of all the parts and sub-parts included in the supply, both of manufacture and of materials, tests and measuring equipment used.

The field monitoring must include the inspection of the installation conditions and the endorsement of the same, which must be the minimum required for the optimal operation of the equipment, indicated in the manuals and plans previously supplied.

The REVAMP PARTS SUPPLIER must include in the offer, in separate items, the supply of the minimum field service required personnel for the pre-commissioning and commissioning tests of the supply components. SUPPLIER shall provide fee rates per day and a detail list of jobs performed by field service personnel.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

2

6. PRESERVATION, PACKAGING, MARKING, LIFTING AND TRANSPORTATION

The REVAMP PARTS SUPPLIER is responsible for the packaging of the parts and components supplied. The SUPPLIER must send the packing, storage and lifting procedure for the respective review and comments by CLIENT and / or its representative. Review or comment by the CLIENT and/or its representative, shall not absolve the SUPPLIER of the responsibility for the packing, storage and lifting procedures.

The REVAMP PARTS SUPPLIERR shall package the equipment taking into account the following aspects:

- Before shipment preparation, the REVAMP PARTS SUPPLIERR shall ensure the cleaning and drying of the internal parts.
- At least one month before the shipment the REVAMP PARTS SUPPLIERR shall submit to the CLIENT the packing list and a Shipment Preparation Procedure and drawings for approval.
- The REVAMP PARTS shall be properly packed in order to avoid damages during transportation and storage. The purchase Order and TAG numbers shall be marked in a visible place.
- Supply and install of removable protection cover on the finished tubesheets. Plastic materials are preferred.
- The gaskets shall be properly packed in rigid boxes. The purchase Order and TAG numbers shall be marked in a visible place.
- Each crate or package shall have the list of contained items (Packing list).
- The beveled connections for welding shall be adequately covered to protect the bevel of damage.
- All openings shall be properly sealed.
- For preservation during transportation, all exposed machined surfaces, such as flange faces, bolting, and stainless-steel surfaces, shall be protected by applying suitable grease, rust preventive oil or coating.
- The REVAMP PARTS shall be supplied with its suitable supports to avoid movement and damage of the tubes during transport. The stiffeners and supports shall be of a material compatible with the body metallurgy.
- The REVAMP PARTS SUPPLIER of the equipment must consider in the packaging of the equipment that is appropriate for outdoor storage for a duration of 6 months in a marine highly corrosive industrial environment. See 107-RP-PJ04-0003 Project Design Data for detailed weather information.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

7. QA AND INSPECTION REQUIREMENTS

7.1. QUALITY MANAGEMENT SYSTEM (QMS)

According to the classification of the document "EDP-G-010 Guía Niveles de inspección (Inspection Levels)" the level of inspection for the REVAMP PARTS is 2, for which the following indication must be followed:

If the requirements of this requisition contemplate elements or equipment that require manufacturing or assembly process and that its level of inspection is 2 or greater, the MANUFACTURER must comply with the document EDP-ET-001-i TECHNICAL SPECIFICATION OF MINIMUM QUALITY REQUIREMENTS FOR EQUIPMENT AND MATERIAL PROCUREMENT, or others indicated by the CLIENT.

The Dossier for manufacturing must be sent to the CLIENT according to the document ECP-WIN-G-GEN-GT-003" GUÍA PARA LA PREPARACIÓN DEL DOSSIER DE MANUFACTURA Y CONTROL DE CALIDAD".

7.2. CRITICITY LEVEL AND INSPECTION LEVEL

The level of criticality for the fired heater (and therefore for its components), according to the HSE-G-035 standard "Guía para Identificar Equipos Criticos por Seguridad de Procesos", is:

- Heat Exchanger 107-CNT-E-101 A CRITICAL
- Heat Exchanger 107-CNT-E-101 B CRITICAL
- Heat Exchanger 107-CNT-E-201 A CRITICAL
- Heat Exchanger 107-CNT-E-201 B CRITICAL

The level of inspection for pressure vessels (and therefore for its components), as indicated in the document "EDP-G-010 Guía Niveles de Inspección", is:

ITEM	CLASS	DESCRIPTION	INSPECTION LEVEL MANUFACTURER
60	11	HEAT EXCHANGER: ASME Sec VIII Div 1. Shell and Tubes. Heat Recovery Steam Generator (HRSG)	2

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

7.3. INSPECTION AND TEST PLAN (ITP)

REVAMP PARTS SUPPLIER shall submit an inspection and test plan with its offer. ITP shall fulfill at least the requirements recorded here:

CLASS: SHELL & TUBE HEAT EXCHANGER			TYPE: HEAT EXCHANGER										MR: 107-MR-ME01-0302		
			INSPECTION LEVEL												
STA GE	ACTIVITIES DESCRIPTION		4		3		2		1		0		REQ. OF CERTIF.	APPLICABLE DOCUMENTS AND REMARKS	
BEFORE FABRICATIO	KOM														Type EN 10204-3.1. for pressure retaining parts ASME Sec. IX
	Material test certificates						R						YES		
	Check of WPS, PQR and WPQs						R						YES		
DURING FABRICATION	Internal and external visual and dimensional check						R						YES	Before PWHT	
	MT or PT for all welds						R						YES	ASME code, NDE procedures	
	PWHT check (if any)						R						YES	Recorded chart	
	X-Rays inspection of butt-welds						R						YES	Film review, welding map	
	Final N.D.E						R						YES	ASME B31.3	
	Coating control quality						R						YES	As per SUPPLIER standard	
	Weld repairs (if any)						R						YES	To be recorded	
FINAL TEST	Overall visual and dimensional check						W						YES	As built sketck to be provided	
	Pneumatic test						R						-	For reinforcing pads (if any)	
	Hydraulic test						R						-	In accordance with ASME B31.3	
	Check of gasket surface														
	Check of cleaning and dryness						R						-		
	Loose materials check						R						YES		
	Packing and shipping preparation inspection						R						YES	In accordance with packing procedure	
DOCUMENTATION	Quality control manufacturing dossier						H						-	As per ECOPETROL standard ECP-VIN-G-GEN-GT-003 "GUIDE FOR PREPARATION OF THE QUALITY CONTROL MANUFACTURING DOSSIER".	

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

8. REQUIREMENTS IN HEALTH, SAFETY AND ENVIRONMENT (HSE)

These requirements are established by the CLIENT in accordance with its health, safety and environment (HSE) policies.

9. TECHNICAL GUARANTEES

The REVAMP PARTS SUPPLIER must guarantee during a period of 12 months from the start-up or 18 months from the dispatch to the CLIENT, the correct functioning of the components to the design conditions in compliance with the requirements established in the data sheets and specifications attached to this requisition.

REVAMP PARTS SUPPLIER shall guarantee performance of the heat exchangers as per revamp data sheet 107-DS-ME01-307 and 107-DS-ME01-308.

The REVAMP PARTS SUPPLIER must guarantee that all materials for the manufacture of the components will be manufactured, assembled and tested in accordance with this specification and its operation will be satisfactory.

Any element that is defective must be replaced as soon as possible, until satisfactory operation is obtained. The replacement will be made at the expense and risk of the REVAMP PARTS SUPPLIER.

Any omission of these specifications in the description does not exonerate the REVAMP PARTS SUPPLIER from the responsibility of delivering the equipment or supply in perfect working and operation status.

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

10. ANNEXES

2

10.1. SCOPE LIST

Ítem	Cantidad	Unidad	TAG	Descripción	Código de Catálogo ECOPETROL
1	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B.	Revamp engineering (Mechanical, hydraulic and thermal design, supply of materials and REVAMP PARTS, manufacturing in workshop, testing, inspection, painting, control and quality assurance, delivery of technical documentation and certificates, packaging / packing, storage and preparation for shipment, spare parts for installation / commissioning / start up, including all components and supports, guarantees and others included and indicated in this requisition. REVAMP PARTS: New front head (including insulation supports) Tube bundle for heat exchangers modifications (including tubesheet, tubes, baffles, tube support, impigment plate, sliding bars, sealing bars, tie rods and all necessary parts for tube bundle for correct performance of heat exchangers according to data sheet for all conditions process.) . All gaskets, packing, name plate updated and hardware (bolts, nuts, washers, clamps, etc.)	N/A

	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

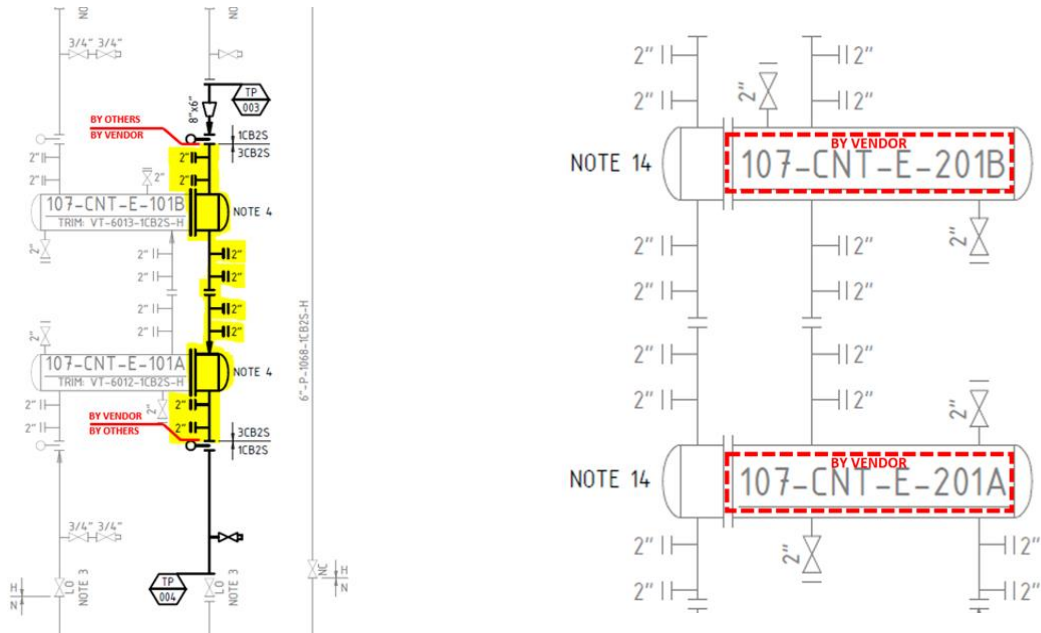
2.	1	GL	107-CNT-E-201 A, 107-CNT-E-201 B.	Revamp engineering, supply of materials and revamp parts, manufacturing in workshop, testing, inspection, painting, control and quality assurance, delivery of technical documentation and certificates, packaging / packing, storage and preparation for shipment, spare parts for installation / commissioning / start up, including all components and supports, guarantees and others included and indicated in this requisition. REVAMP PARTS: Tube bundle for heat exchangers modifications (including tubesheet, tubes, baffles, tube support, impigment plate, sliding bars, sealing bars, tie rods and all necessary parts for tube bundle for correct performance of heat exchangers according to data sheet for all conditions process.) All gaskets, packing, name plate updated and hardware (bolts, nuts, washers, clamps, etc.)	N/A
3.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A, 107-CNT-E-201 B.	Detailed drawings, approved for construction and AS-BUILT drawings	N/A
4.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A, 107-CNT-E-201 B.	List of parts and spare parts for two (2) years of operation and major repair/maintenance including prices. (See 4.11)	N/A
5.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B,	Assistance for installation and assembly. (see 4.9)	N/A

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

			107-CNT-E-201 A, 107-CNT-E-201 B.		
6.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A, 107-CNT-E-201 B.	Assistance for pre-commissioning and commissioning of equipment's components. (see 4.9 and 5.8)	N/A
7.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A, 107-CNT-E-201 B.	Assistance for start-up of equipment's components. (see 4.9)	N/A
8.	1	GL	107-CNT-E-101 A, 107-CNT-E-101 B, 107-CNT-E-201 A, 107-CNT-E-201 B.	Assistance for performance test. (see 4.9)	N/A

The REVAMP PARTS SUPPLIER scope can be seen below:



	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

10.2. REFERENCE STANDARDS

Item	Code	REV.	Name
1	000-SP-ME07-0005	4	Shell And Tube Heat Exchanger Specification
2	000-SP-ME07-0006	5	Heat Exchanger Material Specification
3	000-SP-MU10-0015	4	Equipment Nozzle Loads Specification
4	000-SP-MV09-0001	5	Pressure Vessel Specification
5	000-SP-MV09-0004	3	Pressure vessel requirements for wet hydrogen sulfide (H2S) service specification
6	000-SP-MV09-0007	1	SA 263 Clad Plate Material Specification
7	000-SP-MU10-0004	4	Insulation Materials And Application – Hot Service
8	000-SP-MU10-0001	3	General welding and inspection requirements specification
9	000-SP-MU10-0017	7	Coatings specification
10	000-SP-PR07-0023	3	Shell & Tube Heat Exchangers Process Design Standard
11	000-DG-MV09-0072	2	Name Plate Typical Specification
12	EDP-F-077	2	Formato de solicitud técnicas
13	ECP-VIN-G-GEN-GT-003	1	Guide for preparation of the quality control manufacturing dossier
14	EDP-ET-001-i	1	Technical specification of minimum quality requirements for equipment and material
15	000-PL-PT03-0001	10	Approved Manufacturer's List
16	EDP-G-010	2	Guía para asignación de nivel de inspección
17	EDP-P-013	12	Anexo 1: Procedimiento de Gestión para Homologación de Marcas – Listado de Marcas Homologadas

10.3. REFERENCE DOCUMENTS

Item	Código	REV.	Nombre
1	107-DS-ME01-0307	1	Hoja de Datos Modificaciones Intercambiador de Calor E-101 A/B
2	107-DS-ME01-0308	1	Hoja de Datos Modificaciones Intercambiador de Calor E-201 A/B
3	107-SP-ME07-0302	0	Evaluación Térmica y Mecánica E-101 A/B y E-201 A/B
4	107-GD-PI01-0001	D1	Unit Plot Plan Unit 107 FCC Naphtha Hydrotreater

 Refinería de Cartagena S.A.S.	FORMATO REQUISICIÓN DE MATERIALES COMPRAS MAYORES			
	ECOPETROL DESARROLLO DE PROYECTO VICEPRESIDENCIA DE INGENIERÍA Y PROYECTOS			
	CÓDIGO EDP-F-046	Elaborado 20/11/2017	Versión: 1	

MR: 107-MR-ME01-0302	INGENIERÍA BÁSICA PROYECTO MEJORAS EN UNIDAD DE DESTILACIÓN REACTIVA U-107 PARA ESTABILIDAD Y CUMPLIMIENTO DE 10 PPM AZUFRE	REV: 2
ECP: GRC-107-MEE-MR-000002		
Documento: Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B	Especialidad Mecánica	FECHA: 12/04/2024

5	107-DG-PR05-0021	D4	FCC naphtha hydrotreater piping and instrumentation diagram CDHDS/H2S stripper CDHDS feed/overhead exchangers
6	107-DG-PR05-0006	D1	FCC naphtha hydrotreater piping and instrumentation diagram CDHYDRO feed preheaters
7	107-SP-PI02-0302	D1	Piping Class
8	107-MR-ME01-0302 - Anexo I	2	Criterios de Evaluación Técnica Material Requisition for Revamp Heat Exchanger E-101 A/B and E-201 A/B
9	DG-MR-11210-02-107-CNT-E-201A-01/08	7	Mechanical Drawings Sheet 1 - 8 E-201 A/B - Current
10	DG-MR-11210-02-107-CNT-E-101A-01/08	4	Mechanical Drawings Sheet 1 - 8 E-101 A/B - Current