



UNITES A CYCLE COMBINE GAZ 400 MW

CONTRAT EPC

CENTRALE EMILE HUCHET

ANNEXE 16

**Spécification technique liée aux
Chaudières de récupération
HRSG**

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Annexe 16

Spécification technique liée aux chaudières de récupération (HRSG).

Conformément à ce que prévoit le Contrat EPC, les deux (2) chaudières de récupération (HRSG) seront commandées directement par Endesa France (le Client) à un Chaudiériste et mises à disposition par le Client. Le dimensionnement des HRSG sera fondé sur celui de la centrale à cycle combiné de Pont sur Sambre.

Siemens (le Contractant) s'engage à fournir une prestation d'ingénierie comprenant les prestations ci-après:

- Rédaction de la spécification des HRSG jusqu'aux points d'interface avec le Contrat EPC et tous les autres points divers d'interface technique (note de calcul préliminaire de conception de l'installation, concept de protection contre le bruit, mesures pour les essais de réception, définition des conditions de garantie et de réception, etc.). Cette spécification servira de contrat d'achat des HRSG par le Client.
- Suivi de la bonne adéquation du planning de détail d'études, du montage et de mise en service du Chaudiériste avec le planning général du Contrat EPC.
- Réponses aux questions du Chaudiériste.
- Suivi de la conception et contrôle des données de dimensionnement du Chaudiériste, y compris les notes de calcul.
- Clarification des interfaces.
- Définition des points de mesure et des points de comptage de la consommation.
- Coordination avec le Chaudiériste et le Client de la réalisation des essais.
- Fourniture par le Contractant de son manuel qualité, y compris assistance au Client concernant le suivi de qualité durant les études, la fabrication et le montage des HRSG sur le Site.
- Coordination du montage des HRSG sur le Site.
- Validation de conception des schémas fluides (P&ID's).
- Validation de l'épreuve hydraulique soumise par le Chaudiériste et fourniture d'un concept de mise en service (concept de nettoyage, etc.).
- Intégration du modèle 3D du Chaudiériste dans celui d'ingénierie d'ensemble du Contractant.
- Fourniture de l'ensemble des paramètres techniques à garantir par le Chaudiériste. Dans la mesure où le Chaudiériste le permet, ces valeurs pourront être revues afin d'améliorer le rendement.
- Contrôle et commentaire des documents préparés par le Chaudiériste servant aux essais de réception des HRSG et assistance au Client lors de ces essais.
- Validation du document préparé par le Chaudiériste et servant de base au procès verbal de réception.
- Revue du procès verbal de la mesure de performance des HRSG et validation de celui-ci en accord avec le Client.

Les documents et la correspondance relatifs au développement des HRSG seront rédigés en anglais.



A la signature du Contrat EPC, cette Annexe 16 comprend des documents qui ont été établis en référence à un projet similaire (Pont sur Sambre). Une partie des spécifications est spécifique au projet Emile Huchet et sera établie au cours des trois premiers mois suivants le LNTP (ordre de démarrage des travaux restreints). Les documents actuels de l'Annexe 16 constitueront la base pour la commande des HRSG par le Client au Chaudiériste. Les Parties pourront cependant convenir de remplacer certains documents provisoires de l'Annexe 16 par des mises à jour. Le Client prendra connaissance de ces mises à jour et conviendra ou non de leur mise en application dans la commande des HRSG.

Le Contractant confirme que le dimensionnement de l'ensemble des tubes des HRSG (cf. ASME Section I) du Projet Emile Huchet sera identique à celui de Pont sur Sambre.

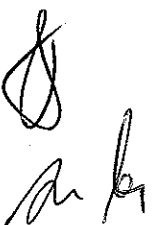
Les prestations susmentionnées conjointement avec le contenu de l'Annexe 16 constituent une description complète des prestations à fournir par le Contractant dans le cadre de sa mission d'ingénierie afin que le Client puisse passer commande des HRSG.

Le Client est responsable des fournitures et prestations suivantes :

- Respect des délais de livraison et fourniture des HRSG et matériel y afférent, y compris pièces de rechange conformément au planning général du Contractant.
- Montage, surveillance du montage et mise en service des HRSG. La mise en service de l'ensemble de la centrale sera cependant effectuée par le Contractant.
- Mise à disposition d'une zone de chantier sur le Site pour le Chaudiériste ainsi que d'une alimentation en électricité, eau potable et eau destinée aux essais de pression pour les HRSG.
- Réception des HRSG conformément aux indications du Contractant, et avec son assistance.

Les obligations du Client et du Contractant pourront être complétées pendant l'exécution du projet d'un commun accord entre ces Parties.

Les documents fournis sont décrits dans la liste des documents ci-après (cf. List of Contract Documents).



Contract Section	App No.	Anlagenbezeichnung Name	Weeks after LNTF	Standard Document	to be modified	Applicable for Contract with Endesa	Remark
Annex 1		HRSG Specification Chapter 01-15	2		x	Siemens to supply	done
Annex 1	1	Extracts from contract with the Owner	2	no		Endesa to supply	
Annex 1	2	HRSG-Terminal Points	2	yes		Siemens to supply	done
Annex 1	3.1	Piping Plan Section Axis 10-10 Boiler Area Piping Arrangement Drawing	5	no	x	Siemens to supply	Preliminary
Annex 1	3.2	Piping Plan Section Axis H Boiler Area Piping Arrangement Drawing	5	no	x	Siemens to supply	Preliminary
Annex 1	3.3	Piping Plan 0.00m Level Boiler Area Piping Arrangement Drawing	5	no	x	Siemens to supply	Preliminary
Annex 1	4	Erection Facilities	5	no	x	Siemens to supply	Preliminary
Annex 1	5	Plant Design Report	7	no	x	Siemens to supply	
Annex 1	5.3	Design sheet	7	no	x	Siemens to supply	
Annex 1	5.3.1	Design Sheet: HP Steam Bypass	7	no	x	Siemens to supply	
Annex 1	5.3.2	Design data sheets HRSG	7	no	x	Siemens to supply	
Annex 1	5.3.3	Permissible Transients and start-up Times	7	no	x	Siemens to supply	
Annex 1	6	P&ID HAD10 / 1 of 2: Heat Recovery Steam Generator HP-System Natural Circulation Page 1 of 2	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	System Description HAD10: Heat Recovery Steam Generator HP-System Natural Circulation Steam Generator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID HAD 50 / 1 of 2: Heat Recovery Steam Generator IP-System (Natural Circulation)	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID HAD 50 / 2 of 2: Heat Recovery Steam Generator Reheater (Natural Circulation)	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description HAD 50: Heat Recovery Steam Generator IP-System / RH Natural Circulation Steam Generator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID HAD 80: Heat Recovery Steam Generator LP-System (Natural Circulation)	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description HAD 80: Heat Recovery Steam Generator LP-System Natural Circulation Steam Generator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID LBG: Auxiliary Steam Piping System with our Thermal Deaerator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description LBG: Auxiliary Steam Piping System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID LBH 10: Startup and Shutdown Steam System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description LBH 10: HRSG Start-up and Shutdown System Steam Generator Drains System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID LCA 30 / 1 of 2: Condensate Preheater System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID LCA 30 / 2 of 2: Condensate Preheater System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description LCA 30: Condensate Preheating	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID LAA20: Bypass Deaerator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description LAA20: Bypass Deaerator	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	P&ID HBK 10: Heat Recovery Steam Generator Exhaust Gas System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	Description HBK 10: Heat Recovery Steam Generator Exhaust Gas System	7	no	x	Siemens to supply	PsS to be adopted
Annex 1	6	L Triple pressure process with reheating Single Shaft	2	no	x	Siemens to supply	Preliminary
Annex 1	7	Fuel Data	1	no		Endesa to supply	PsS Standard
Annex 1	8	Specification for interface downstream of a Diverter / Blanking Plate or between Exhaust Diffuser and Boiler	2	yes		Siemens to supply	PsS Standard
Annex 1	9	Site Installation Plan	5	no	x	Siemens to supply	Preliminary
Annex 1	10.1	Piping Design Requirements		yes		Siemens to supply	done
Annex 1	10.2	Forces and Moments at Boilers Header Nozzles		yes		Siemens to supply	done
Annex 1	10.3	Piping Stress Calculation		yes		Siemens to supply	done
Annex 1	11	Noise Protection Concept	6	no	x	Siemens to supply	PsS Standard
Annex 1	12	Specification for Thermal Insulation		yes		Siemens to supply	
Annex 1	13.1	Coating Warranty		no	x	Siemens to supply	
Annex 1	13.2	Coating Instruction		no	x	Siemens to supply	
Annex 1	13.3	HRSG Temporary coating of Heating Surfaces		yes	x	Siemens to supply	done
Annex 1	14	F-AW E-07/047 Preservation of Plant Components		yes		Siemens to supply	done
Annex 1	15	3D-Modelling Requirements		yes		Siemens to supply	done
Annex 1	16	Requirements for Design reports		yes		Siemens to supply	done
Annex 1	17	Time Schedule		no	x	Siemens to supply	
Annex 1	18	not used				Siemens to supply	
Annex 1	19	Technical Specification for Bypass Deaerator		yes		Siemens to supply	PsS Standard
Annex 1	20.1	Basic Engineering Definitions for Process, I&C, and Electrical Design and further Steps during Project Execution		yes		Siemens to supply	done
Annex 1	20.2	Specification for Electrical I&C Design and Layout of Black Boxes (I&C 2 Wochen, BB List 6 Wochen, Interface Drawings 6 Wochen) (Final Electrical BB-Spec 6 Wochen)	14	no		Siemens to supply	PsS Standard
Annex 1	20.3	Limits for I&C Cabling and Termination HRSG	7	no		Siemens to supply	PsS Standard
Annex 1	20.4	Minimum Requirements for Electrically Motorized Valve Actuators with Integrated Power Control	7	no		Siemens to supply	PsS Standard
Annex 1	20.5	I&C Cables	7	no		Siemens to supply	PsS Standard
Annex 1	20.6	Instrumentation and Peripheral Devices	7	no		Siemens to supply	PsS Standard
Annex 1	20.7	Engineering Data I&C Periphery	7	no		Siemens to supply	PsS Standard
Annex 1	20.8	n.a.		no		Siemens to supply	PsS Standard
Annex 1	20.9	Interfaces Electrical Engineering HRSG	7	no		Siemens to supply	PsS Standard
Annex 1	20.10	Specification for design of earthing system, lightning protection system and shielding requirements	7	no		Siemens to supply	PsS Standard
Annex 1	20.11	Specification for MV/LV Power Cable and Electrical Control Cable (U<60V)	7	no		Siemens to supply	PsS Standard
Annex 1	20.12	Specification for Cable Support System, HRSG	7	no		Siemens to supply	PsS Standard
Annex 1	20.13	Specification for lighting and small power system	7	no		Siemens to supply	PsS Standard
Annex 1	21.1	Cleaning Concept for Boilers and System Exposed to Steam	2	yes		Siemens to supply	PsS Standard
Annex 1	21.2	Volumes and Diameters of Systems to be cleaned	2	no		CM to supply	
Annex 1	21.3A	Atmospheric Steam Blowing of HRSG, Single Shaft and Multi Shaft, and steam pipes	2	yes		Siemens to supply	PsS Standard
Annex 1	21.3B	Steam Blowing of HRSG and steam pipes by augmented bypass operation, Single Shaft and Multi Shaft	2	yes		Siemens to supply	PsS Standard
Annex 1	21.4	Chemical Cleaning of Heat Recovery Steam generator (HRSG) / Steam-Water-Cycle	2	yes		Siemens to supply	done
Annex 1	22	List of Black Boxes	3	yes		Siemens to supply	done
Annex 1	23.1	not used				Siemens to supply	done
Annex 1	23.2	List of Assembly Instructions / Method statements	2	yes		Siemens to supply	done
Annex 1	23.3	not used				Siemens to supply	done
Annex 1	23.4	Description of Commissioning sequence		yes		Siemens to supply	PsS Standard
Annex 1	24	not used				Siemens to supply	
Annex 1	25.1	HRSG Performance Test Specification	6	no	x	Siemens to supply	
Annex 1	26	not used				Siemens to supply	
Annex 1	27	not used				Siemens to supply	

Contract Section	App No.	Anlagenbezeichnung Name	Weeks after LNTF	Standard Document	To be modified	Applicable for Contract with Endesa	Remark
Annex 1	28	General Design Criteria for Structural Engineering (GDCSE)	4	no	x	Siemens to supply	
Annex 1	29	Stairs, Handrails, Ladders, (all typicals)		yes		Siemens to supply	PsS Standard
Annex 1	30	Design Requirements for Drain Pots, Drains and Water Columns	2	yes		Siemens to supply	done
Annex 1	31	not used				no	
Annex 1	32	HOLDING DOWN BOLTS FABRICATION, INSTALLATION		yes		Siemens to supply	PsS Standard
Annex 1	33.1	Once Through Boiler Single Shaft Dosing System QC	2			no	
Annex 1	33.2	Once Through Boiler Single Shaft Sampling System QU	2			no	
Annex 1	33.3	Once Through Boiler Multi Shaft Dosing System QC	2			no	
Annex 1	33.4	Once Through Boiler Multi Shaft Sampling System QU	2			Siemens to supply	PsS Standard
Annex 1	33.5	Drum Type Boiler Single Shaft Dosing System QC	2			Siemens to supply	PsS Standard
Annex 1	33.6	Drum Type Boiler Single Shaft Sampling System QU	2			no	
Annex 1	33.7	Drum Type Boiler Multi Shaft Dosing System QC	2			no	
Annex 1	33.8	Drum Type Boiler Multi Shaft Sampling System QU	2			Siemens to supply	
Annex 1	34	n.a. - HRSG-Manufacturing and Erection Surveillance	2	yes		no	done
Annex 1	35	n.a. - Specification Auxiliary Steam Generator	2	yes		Siemens to supply	done
Annex 1	36	Design Requirements for LHM System (Bungartz Pump)	2	yes		Siemens to supply	done
Annex 1	37.1	Requirements for Boiler Feedwater and Boiler Water Chemistry	6	yes		Siemens to supply	done
Annex 1	37.2	Specifications Turbine Steam Purify	6	yes		Siemens to supply	done
Annex 1	38.1	Planning Instructions for Control Valves		yes		Siemens to supply	PsS Standard
Annex 1	38.2	Design Specification of Control Valves		yes		Siemens to supply	PsS Standard
Annex 1	39	not used		yes		no	
Annex 1	40	Requirements for Media used for Hydrostatic testing and Flushing		yes		Siemens to supply	PsS Standard
Annex 1	41.1	Fire Protection Concept	7	no	x	Siemens to supply	
Annex 1	41.2	Explosion Protection Concept	7	no	x	Siemens to supply	
Annex 1	42	Specification of valves		yes		Siemens to supply	PsS Standard
Annex 1	43	n.a. - Stack maintenance cradle		yes		no	done
Annex 1	42	n.a. - Specification for Kettle Boiler / Rotor Air Cooler		yes		no	done
Annex 1	43	n.a. - Specification for the Design of SCR/CO Catalyst		yes		no	done
Annex 1	I	General Arrangement		no		CMI to supply	
Annex 1	II	Side Elevation HRSG		no		CMI to supply	
Annex 1	III	Front Elevation HRSG		no		CMI to supply	
Annex 1	IV	Plan View HRSG		no		CMI to supply	
Annex 1	V	Technical Data Sheets		no		CMI to supply	
Annex 1	VI	Positions of Columns, Loads		no		CMI to supply	
Annex 1	VII	Arrangement of Pressure Parts		no		CMI to supply	
Annex 1	VIII	Drums with Internals		no		CMI to supply	
Annex 1	IX	Welding Details:		no		CMI to supply	
Annex 1		□ Tube to Header		no		CMI to supply	
Annex 1		□ Header End Caps		no		CMI to supply	
Annex 1		□ Stub to Drum		no		CMI to supply	
Annex 1		□ Exhaust Gas Casing		no		CMI to supply	
Annex 1	X	Flash Tank		no		CMI to supply	
Annex 1	XI	Insulation		no		CMI to supply	
Annex 1	XII	Erection Concept and Manpower Curve		no		CMI to supply	
Annex 1	XIII	Power Consumption at Site		no		CMI to supply	
Annex 1	XIV	Profile of Project Leader		no		CMI to supply	
Annex 1	XV	Subvender List		no		CMI to supply	
Annex 1	XVI	Noise Requirements		no		CMI to supply	
Annex 1	XVII	Forces and Moments to the Manifolds		no		CMI to supply	
Annex 1	XVIII	Shipping Information (Weights, Dimensions, Component descriptions, etc.)		no		CMI to supply	
Annex 1	XX	Questions to Contractor		no		no, commercial	
Annex 2		Excluded Items		no		no, commercial	
Annex 3		Advanced Payment Guarantee		no		no, commercial	
Annex 4		Performance Guarantee		no		no	
Annex 5		not used				no, commercial	
Annex 6		Parent Company Guarantee		no		no, commercial	
Annex 7		Declaration on Export Restrictions		no		no, commercial	
Annex 8		List of Substances		no		no, commercial	
Annex 9	1	Packing and Dispatch Guidelines	6	yes	x	Siemens to supply	
Annex 9	2	Spare Parts Handling	6	yes		no	
Annex 9	3	Handling of Engineering-CCPP Data	6	yes	x	Siemens to supply	
Annex 9	4	Assembly instruction	6	yes	x	Siemens to supply	
Annex 9	5	Lubrication Schedule, Consumables, Special Tools	6	yes		no	
Annex 9	6	KKS Ident. System for Power Plants, Establishments for CCPP, acc. To the Guidelines for KKS Application	6	yes	x	Siemens to supply	
Annex 9	7	Planning Documentation, Operating and Maintenance Manuals	6	yes	x	Siemens to supply	
Annex 9	8	Requirements for Electronic Document Exchange	6	yes	x	Siemens to supply	
Annex 9	9	DP-Interface with Contractors Information Security and Data Protection	6	yes	x	Siemens to supply	
Annex 9	10	Requirements on the Provisional KKS Labeling	6	yes	x	Siemens to supply	
Annex 9	11	Requirements on the Permanent KKS Labeling	6	yes	x	Siemens to supply	
Annex 9	12	Planning Specification	6	yes	x	Siemens to supply	
Annex 9	13	n.a.	6	yes	x	Siemens to supply	
Annex 9	14	Abbreviation Catalog	6	yes	x	Siemens to supply	
Annex 9	15	Symbols for P&I Diagrams	6	yes	x	Siemens to supply	
Annex 9	16	Insurance (project specific)	6	no	x	Siemens to supply	
Annex 9	17	n.a.	6	yes	x	Siemens to supply	
Annex 9	18	n.a.	6	no		Siemens to supply	
Annex 9	19	Quality Assurance	6	no	x	Siemens to supply	
Annex 9	20	n.a.	6	yes	x	Siemens to supply	
Annex 9	21	Risk Assessment / Method Statements	6	yes	x	Siemens to supply	
Annex 9	22	n.a.	6	yes	x	Siemens to supply	
Annex 9	23	n.a.	6	yes	x	Siemens to supply	
Annex 9	24	Health and Safety Management Plan (H&SMP)	6	yes	x	Siemens to supply	
Annex 9	25	Site Regulations	6	yes	x	Siemens to supply	
Annex 9	26	Environmental Requirements	6	yes	x	Siemens to supply	
Annex 9	27	Commissioning Documents	6	yes	x	Siemens to supply	
Annex 9	28	WEB Collaboration	6	yes	x	Siemens to supply	
Annex 9	29	Training of Owner's personnel	6	yes	x	Siemens to supply	
Annex 9	30	Environment Management plan	6	yes	x	Siemens to supply	
Annex 9	31	CE Marking	6	yes	x	Siemens to supply	
Annex 9	32	TFA Personnel	6	yes	x	Siemens to supply	
Annex 10		Spare Parts Tender		no		no	
Annex 11		List of EPC Contract Documentation		no		no	