

كهرباء لبنان
"مؤسسة عامة"
ELECTRICITE DU LIBAN
"Etablissement Public"

[]

شارع النهر - بيروت - تلفون : 01-442720
تلغرافيا : كهرباء لبنان
فاكس : 01583084

[]

رقم المحفوظات ١٩٧٩
رقم الصادر
بيروت في: ٢٠٢٦/٠٤/٢١

الموضوع: المناقصة العمومية رقم م.ع. ٢٠٢٦/١٧ - شراء مشعات لزوم نظام التبريد على المجموعتين الغازيتين في معمل صور الحراري - توضيحات دفعة ثانية على أسئلة واردة من عارضين محتملين - المادة ٢١ من قانون الشراء العام.
المراجع:

بالإشارة الى الموضوع أعلاه، وعطفاً على الدعوة إلى المناقصة العمومية رقم م.ع. ٢٠٢٦/١٧ بموضوع شراء مشعات لزوم نظام التبريد على المجموعتين الغازيتين في معمل صور الحراري المُعلن عنها على موقع هيئة الشراء العام تحت الرقم ١١٣٣٤ بتاريخ ٢٠٢٦/٠٣/٠٩،

نفيدكم أنه ورد المؤسسة من عارض محتمل السؤال التالي، وتبدي مؤسسة كهرباء لبنان جوابها عليه كما يلي:

Question 1:

Kindly provide us with the datasheet of the existing fin fan cooler and heat exchanger bundle.

Answer 1:

Please find attached the datasheet of the existing fin fan cooler and heat exchanger bundle (20 pages).



يومل أخذ العلم.

ع.ب.

ف.ب.

ر.ر.

رئيس مجلس الإدارة
المدير العام

كمال الحايك

GEC ALSTHOM	EUROPEAN GAS TURBINE	SECTION 05
	UNIT FIN FAN COOLER	N°91.431232
		SHEET N° 78 CONT.ON N°

UNIT FIN FAN COOLER

General Arrangement drawing

**EGT : 91.024724
GES : 63063.0000**

TYR

PART 5 = ERECTION GUIDE

MODIF.					SECTION 05
DATE					N°91.431232
					SHEET N° 78 CONT.ON N°

A	FIRST ISSUE <i>Preière diffusion</i>	21.11.95	GAMBEE.J	<i>[Signature]</i>	GROCH.R	<i>[Signature]</i>	BAUDE.P	<i>[Signature]</i>
REV.	A M	DATE	NOM / NAME	VISA	NOM / NAME	VISA	NOM / NAME	VISA
MODIFICATIONS			PAR / BY		VERIFIE/CHECKED		APPROUVE/APPROVED	

REPUBLIC of LEBANON
 MINISTRY of HYDRAULIC & ELECTRICAL RESOURCES
 ELECTRICITE DU LIBAN

TYR

GAS TURBINES POWER PLANT
 (2 GT MS 600IB)

REFERENCE Nber : 9,5,R,0,6 1,8,1 M 0,0,2,A

ECH. / SCALE	DATE	21.11.95	21.11.95	21.11.95
/	NOM / NAME	GAMBEE.J	GROCH.R	BAUDE.P
	VISA	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
	REDIGE / MADE		VERIFIE / CHECKED	APPROUVE/APPROVED

FORMAT	TITRE/TITLE
A4	OFF BASE COOLER (OPEN CYCLE) EQUIPMENT ARRANGEMENT

ERECTION BOOK

INFORMATIONS INTERNES EGT SA
EGT SA INTERNAL INFORMATIONS

FAMILLE ART	NOM FOURN. / SUPPL. NAME		EUROPEAN GAS TURBINES	
<u>1111</u>	G E A / G E S			
GI. DOC	BO. GR	G E C A L S T H O M		
<input checked="" type="checkbox"/>	<input type="checkbox"/>			
DIFFU.	NATU.	N° 91.431.233		SECT. DOC.
<u>1</u>	<u>1</u>			<u>0,1</u>
LANGUE	Nb DOC.FOUR. / SUPPLIER DOC. Nb			A
E	63063.0181			
EMETTEUR	CONT.ON SHT. 2	SHT. N 1	SHT. N 1	CONT.ON SHT. 2
<u>1910</u>				

G E C ALSTHOM	EUROPEAN GAS TURBINES	SECTION 5
	AEROREFRIGERANT GROUPE	N° 91 .431 233
	ERECTION PROCEDURE	FEUILLE N°2 SUITE SUR n°3 SHEET CONT.ON

1 AIM

This procedure definie :

- . The preparing of working
- . The inspection to be carried out before erection
- . The documents to be considered
- . Description of erection working

1.1 Note :

Before erection, all earth works and civil works must be finished.

1.2 Working plant :

Installation of electrical working box.

Fixing and delimitation of erection areas and installation of lifting means.

2 CIVIL WORK ACCEPTANCE

2.1 Documents to be consulted :

Civil work guide drawing 91.024 725

2.2 Checks to be made :

Check the position and level of concrete flag

Check the flatness and horizontality of concrete blocks.

2.3 Check means

Levelling instrument

Tape measure (one metre)

Tape measure (ten metres)

3 LIST OF DRAWINGS

PID Drawing : 91.113510-SH01 - Réf. EGT :95 R06 181 R 001

Civil work guide drawing : 91.024 725 - Réf. EGT 95 R06 181 Q 002

Equipment arrangement drawing : 91.024 724 - Réf. EGT 95 R06 181 Q001

Frame detail drawing : 91.025 068 - Réf. EGT 95 R 06 181 Q 003

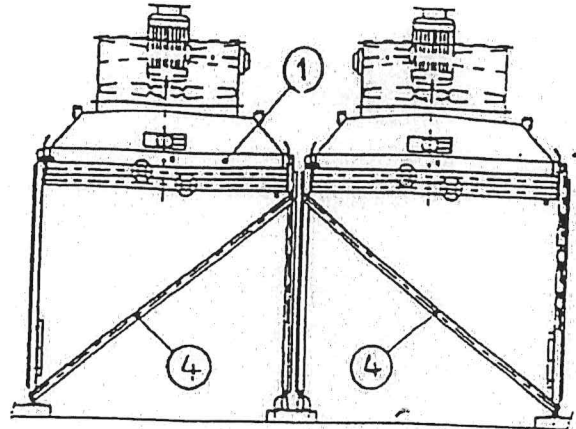
Module detail drawing : 91.113 623 - Réf. EGT 95 R 06 181 Q 006

MODIF.	A					SECTION 5
DATE	21/11/95					N°91.431 233
VISA						FEUILLE N°2 SUITE SUR N°3 SHEET CONT.ON

4.2 Assembling

4.2. 1. Modules (drawing 91.113.623)

- . Begin by the 1st module then by chronological order
- . Lift the module (exchanger, framework, plenum and fans) by the 4 lifting brackets located on four corners (Hole dia 30 mm)
- . Please ensure that following sling angles are adhered to : length : 90 °
width : 50 to 70 °
- . Fit the four legs of module on the frame



Piping side : File A : mark Ai,j
i : corresponding to file number (1 to 4)
j : corresponding to module number (1 to 3)

Opposite side : File B : mark Bi,j
i and j being defined as above
Bolts : HM 16 x 50 and Nylstop nut and M'washer

Tightening torque : 19,5 da N.m

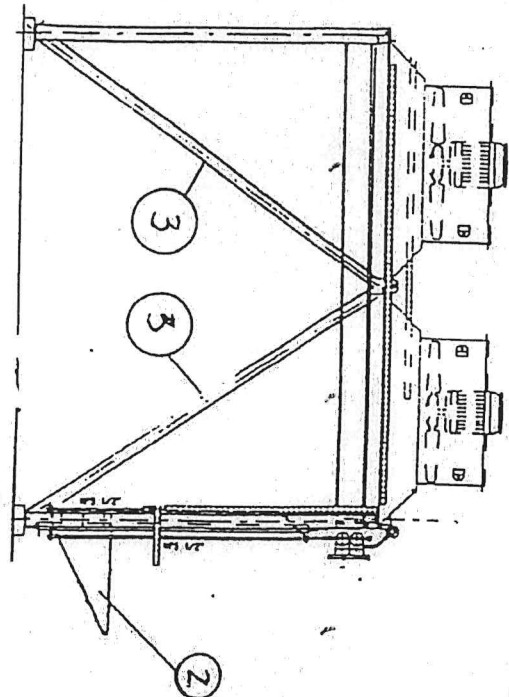
- . Mount the 4 longitudinal wind bracings (mark 3) (Pipe 2" dia) and the 2 Lateral wind bracings (mark 4) (Pipe 2" dia)
- Bolts : HM 16 x 50 and Nylstop nut and M'washer
- Tightening torque : 19,5 da N.m

4.2.2. - Putting in place

- . Place the module onto the right position on the concrete block.
- Put the shims under the base-plate.
- See civil work guide dwg : 91. 024 725
- . Maxi differential level between the base plates + - 2mm
- . Tolerance of verticality of legs = 1/500 e of height

- . Proceed of the same manner for the mounting of the 2 others modules.

- . Mount the piping supports (mark 2) without tight them
- Bolts : HM 12 x 30 and Nylstop nut and M'washer
- . Mount the silencers onto the fan
- Bolts : HM 10 x 30 and Nylstop nut and M washer



MODIF.	A					SECTION 5
DATE	21/11/95					N° 91.431.233
VISA						FEUILLE N°4 SUITE SUR N°5 SHEET CONT ON

G E C ALSTHOM

EUROPEAN GAS TURBINES
AEROREFRIGERANT GROUPE
ERECTION PROCEDURE

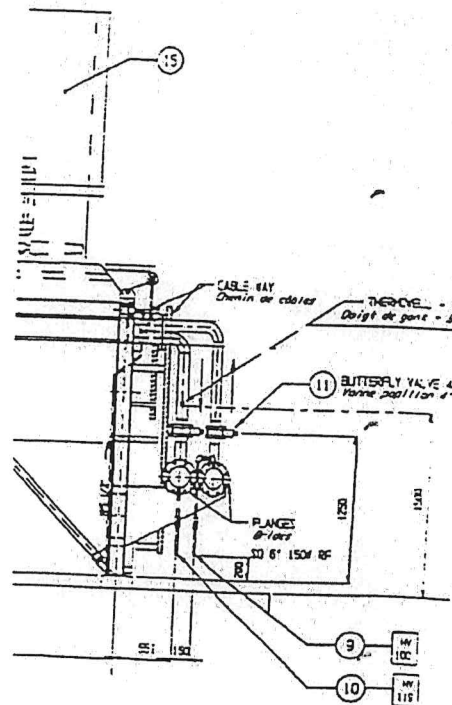
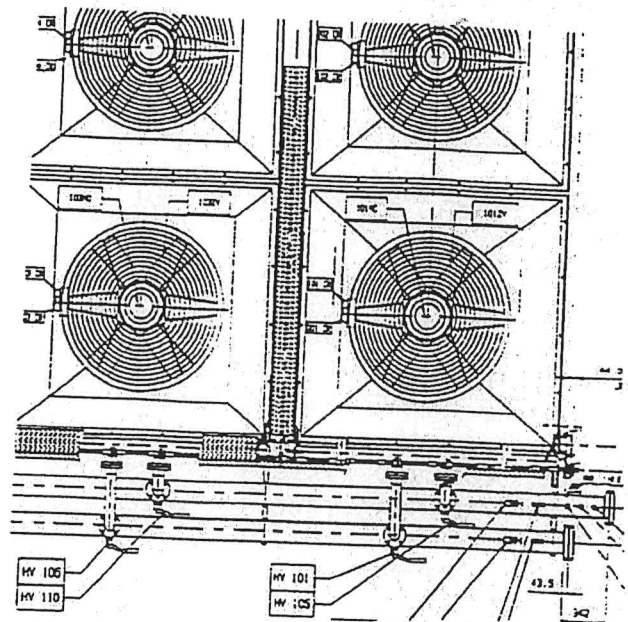
SECTION 5

N° 91.431 233

FEUILLE N°5 SUITE SUR N°6
SHEET CONT.ON

4.2. 3. Pipings (drawing 91. 025 624)

- . Clean the protecting on the flange raised faces.
- . Mount the butterfly valve dia. 4" onto the main pipings.
Stud bolts M 16 x 150 and nut 2H
Tightening torque : 11 daN.m
- . Fix the elbow pipes onto the butterfly valves (respectively on inlet and outlet piping).
- . Mount the main pipings onto their supports.
- . Fix each pipe onto the inlet and outlet of exchanger.
- . Gasket 4" - 150 Lbs
Stud bolts M 16 x 95 and nut 2H
- . Fix one of end module onto the plots with anchor bolts (type FBRM 16 x 140)
See civil work guide dwg : 91. 024 725
Tightening torque : 12 da N.m
- . Adjust the position of main pipes support in order that they will be in contact with the pipes
- . Tight the bolts HM12 x 30
Tightening torque : 8,1 da N.m
- . Fix the other modules on the blocks as describe above.
- . Mount the collar dia 6" to fit the main pipings on their supports.



MODIF.	A					SECTION 5
DATE	21/11/95					N° 91.431 233
VISA						FEUILLE N°5 SUITE SUR N°6 SHEET CONT.ON

G E C ALSTHOM

EUROPEAN GAS TURBINES
AEROREFRIGERANT GROUPE
ERECTION PROCEDURE

SECTION 5

N° 91.431.233

FEUILLE N°6 SUITE SUR N°7
SHEET CONT. ON

4.2. 4. Vent, drain, degazing pipes

. Mount the degazing line dia 1" onto the module plenum with collar 1", connect together with gasket 1" 150 Lbs. Stud bolts M 12 x 70 and nut 2H
Tightening torque : 6 daN.m

. Connect the flexible pipes dia 1/2" between exchanger and degazing line.

. Mount the vent and drain pipes dia 1/2" onto the inlet and outlet exchanger header.

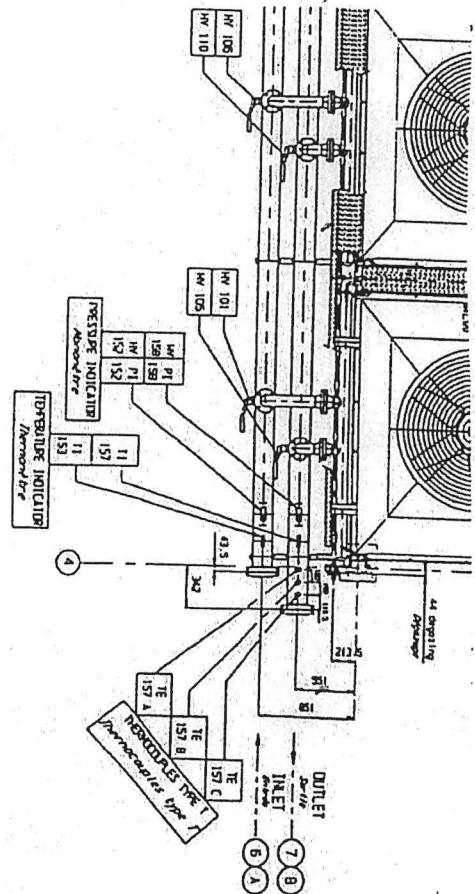
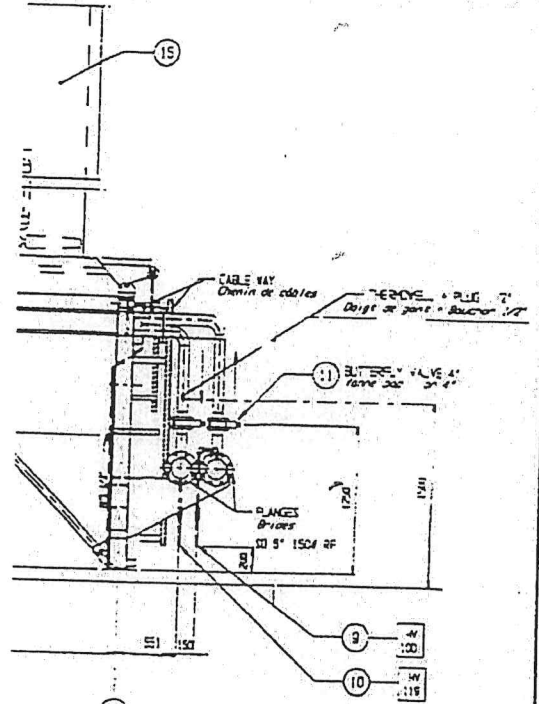
. Fix these with collar 1/2" onto their supports.

4.2. 5 Accessories
(Dwg 91.024724)

. Install the cable trays support

. Mount the instruments onto the main inlet and outlet pipings.

- 2 manifolds (mark HV152 and HV158)
- 2 manometers (mark PI 152 and PI 158)
- 2 thermometers (mark TI 153 and TI 157)
- 3 thermocouples (mark TE 157A, TE 157B, TE 175C)
- 1 drain valves (mark HV119)
- 1 vent valve (mark HV 100)



MODIF.	A				
Date	21/11/95				
VISA					

SECTION 5
N° 91.431.233
FEUILLE N°6 SUITE SUR N°7
SHEET CONT. ON

G E C ALSTHOM	EUROPEAN GAS TURBINES	SECTION 5
	AEROREFRIGERANT GROUPE	N° 91 .431 233
	ERECTION PROCEDURE	FEUILLE N°7 SUITE SUR 8 SHEET CONT.ON

4.2. 6. Electrical connection
(dwg 91.024724)

- . Couple the modules to earth with the earthing connection.

- . Install the equipotential lines between framework and legs with the earthing connection.

MODIF.	A					SECTION 5
DATE	'21/11/95					N° 91 .431 233
VISA						FEUILLE N°7 SUITE SUR 8 SHEET CONT.ON

G E C ALSTHOM

EUROPEAN GAS TURBINES
AEROREFRIGERANT GROUPE
ERECTION PROCEDURE

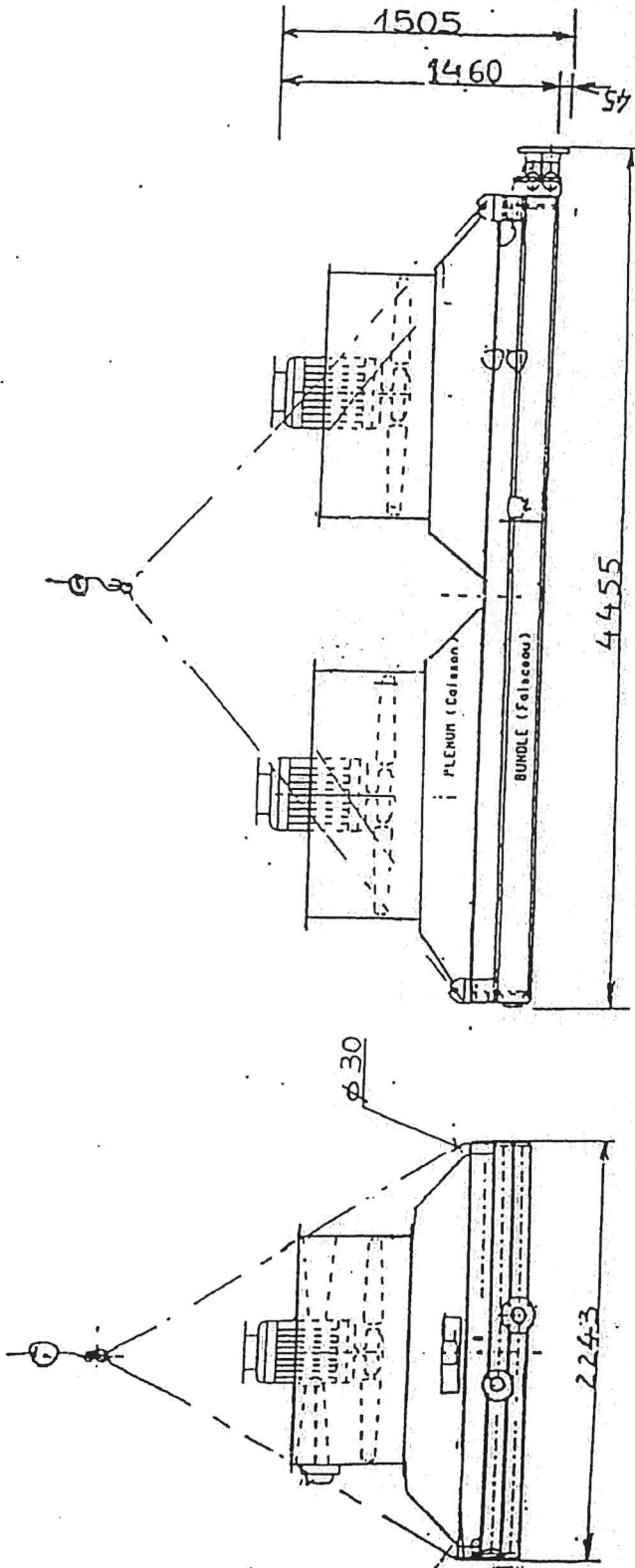
SECTION 5

N° 91. 431 233

FEUILLE N°8 SUITE SUR F
SHEET CONT.ON

HANDLING

Module



Weight = 2100 kg

MODIF.	A			
DATE	'21/11/95			
VISA				

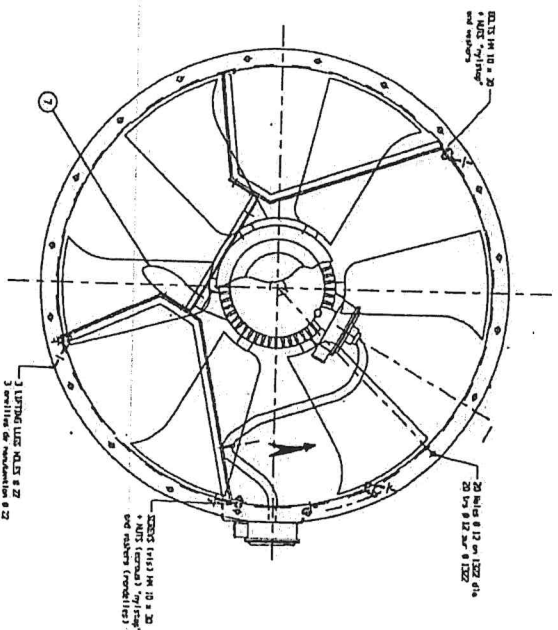
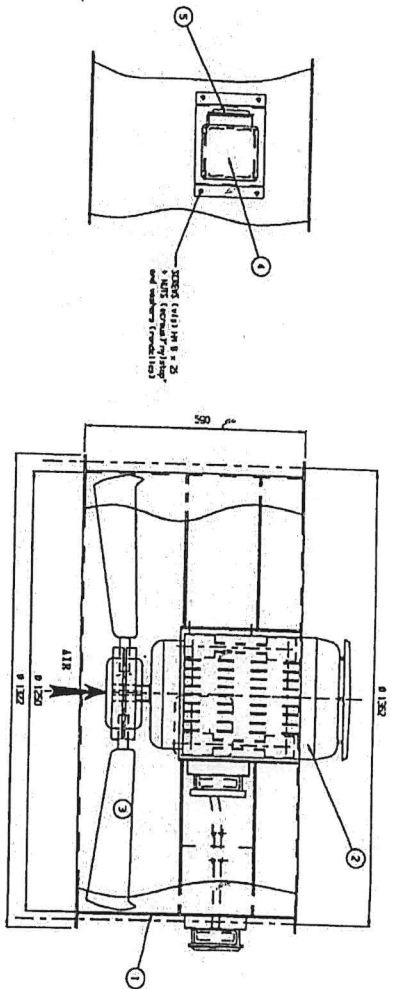
SECTION 5
N° 91.431.233
FEUILLE N°8 SUITE SUR F
SHEET CONT.ON

المواصفات الفنية مستقر 2

TYR POWER PLANT	
FIN FAN COOLERS MODULE NUMBER	G02 01
FBARICATION DRAWING NUMBER	
MANUFACTURER	63063.014
EGT	91113.623
CLIENT	MMER

GT FIN FAN COOLERS	
PROJECT : TYR	
MANUFACTURER	GEA - GES
FABRICATION NO	471/63063
DATE OF CONSTRUCTION	Oct-95
SERIAL NUMBER	1B
CONSTRUCTION CODE	ASME/
GENERAL ARRANGEMENT DRAWING NUMBER	
MANUFACTURER	63063.0000
EGT	91.024.724
CLIENT	MMER

A



ITEM REP	QUANTITY	DESIGNATION	DESIGNATION
7	1	Tresse de nosse	Earth connection
5	1	Boite à bornes résistance	HEATER TERMINAL BOX
4	1	Boite à bornes moteur	MOTOR TERMINAL BOX
3	1	Hélice 6 pales	PROPELLER 6 BLADES
2	1	Moteur WDF-180 L WDF-11 KV/220V - Moteur WDF-180 L 11 KV/220	
1	1	Virrole ep 4 mm	SCREW TH 4mm

POIDS TOTAL - TOTAL WEIGHT : 375 Kg
 POIDS MOTEUR - MOTOR WEIGHT : 212 kg

PAINTING SPECIFICATION
 ACCORDING TO SPECIFICATION N° 91.429.989 TYPE E
 AND SPECIFICATION N° 91.421.666

SPECIFICATION PEINTURE
 SUVANT LA SPECIFICATION N° 91.429.989 TYPE E
 ET LA SPECIFICATION N° 91.421.666

GAS TURBINES POWER PLANT
 (2 GT MS 6001B)

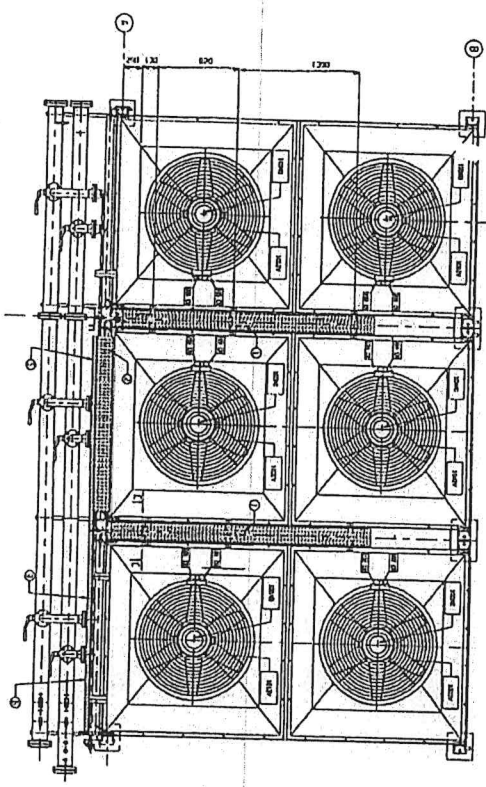
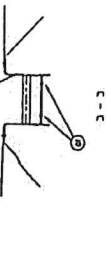
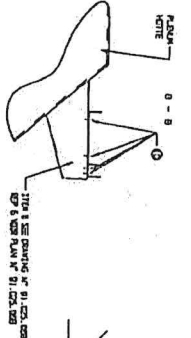
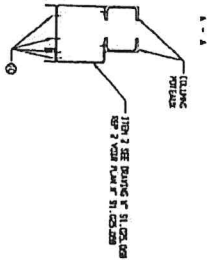
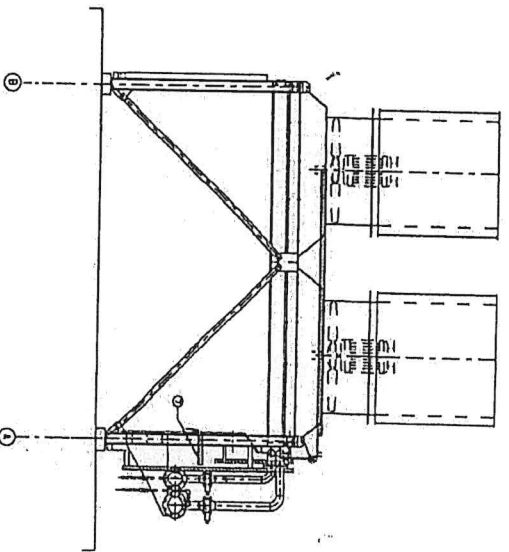
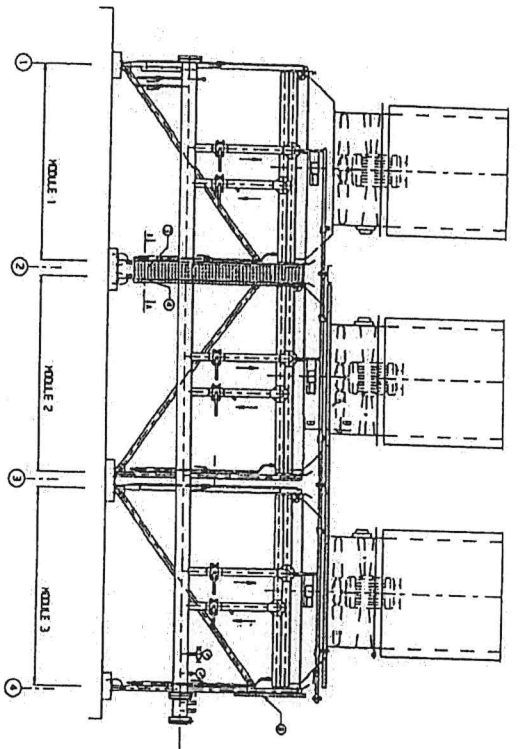
TYR

REPUBLIC of LEBANON
 MINISTRY of HYDRAULIC & ELECTRICAL RESOURCES
 ELECTRICITE DU LIBAN

REFERENCE N° :	9.5.R.O.5	1.8.1.0	0.0.7.B
EQI. / SCALE	21.09.95	21.09.95	21.09.95
1/10	NON / NAME	GRDJA.P	RIBICKI.B
	VISA		GAJEE.J
REQUIE / MADE	VERIFIE / DECED	APPROUVE / APPROVED	

DFP BASE COOLER (OPEN CYCLE)
 EQUIPEMENT ARRANG.
 FAN AND MOTOR DETAIL
 DETAIL DU MOTEUR ET VENTILATEUR

INFORMATIONS INTERNES SOIT SA SOIT SA INTERNAL INFORMATION	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
PAROLE / INT	DATE	21.09.95	21.09.95	21.09.95
LANGUE	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
DESIGNATEUR	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
N° 91.205.015	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
63053.0150	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
SECT. DOC.	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
A	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J
B	NON / NAME	GRDJA.P	RIBICKI.B	GAJEE.J



NOTE: NOT TO SCALE
 1/8" = 1'-0"

ITEM NO.	QUANTITY	DESCRIPTION	REVISION	DATE
1	1	1-101 1 SEE DRAWING OF SI. COOL. GAS BY 1 VIEW PLAN OF SI. COOL. GAS		
2	1	1-101 2 SEE DRAWING OF SI. COOL. GAS BY 2 VIEW PLAN OF SI. COOL. GAS		
3	1	1-101 3 SEE DRAWING OF SI. COOL. GAS BY 3 VIEW PLAN OF SI. COOL. GAS		
4	1	1-101 4 SEE DRAWING OF SI. COOL. GAS BY 4 VIEW PLAN OF SI. COOL. GAS		
5	1	1-101 5 SEE DRAWING OF SI. COOL. GAS BY 5 VIEW PLAN OF SI. COOL. GAS		
6	1	1-101 6 SEE DRAWING OF SI. COOL. GAS BY 6 VIEW PLAN OF SI. COOL. GAS		
7	1	1-101 7 SEE DRAWING OF SI. COOL. GAS BY 7 VIEW PLAN OF SI. COOL. GAS		
8	1	1-101 8 SEE DRAWING OF SI. COOL. GAS BY 8 VIEW PLAN OF SI. COOL. GAS		
9	1	1-101 9 SEE DRAWING OF SI. COOL. GAS BY 9 VIEW PLAN OF SI. COOL. GAS		
10	1	1-101 10 SEE DRAWING OF SI. COOL. GAS BY 10 VIEW PLAN OF SI. COOL. GAS		

TYR

GAS TURBINES POWER PLANT
 (2 OF 15 SHEETS)

REPUBLIC OF LEBANON
 MINISTRY OF PETROLEUM & ELECTRICAL RESOURCES
 ELECTRICITE DU LIBAN

REVISION PLAN
 EUROPEAN GAS TURBINES

L E A / G E S

EUROPEAN GAS TURBINES

REV. 01.005.007

