



**Subject: e-AMINE SERVICE SUPPORT (e -AS) & e-AMINE MANAGEMENT (e -AM) FOR GAS TREATMENT**

Dear all,

We are all affected by the Covid-19 Pandemic and we are restricted in our movements. This situation will remain for some time. WORLD IMAGE is close to you and can still service you in a very effective way. We are offering the:

**e -AMINE SERVICES (e -AS) and**  
**e -AMINE MANAGEMENT(e -AM).**

In this way we can see each other online, discuss your questions, problems, the analysis results and offer immediate remedial actions.

We will be using the advanced video applications available today and this will bring us together to work as a team.

Please have a look at our proposal.

**AMINES GLOBAL SERVICES e-SERVICES**

Best regards

Ing. Fabrizio Pisanelli

world image srl  
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**e -SERVICE FOR GAS TREATMENT AND AMINE MANAGEMENT**

The Covid-19 pandemic is preventing our company to reach your plants.


Since a good running of plants is necessary, as well as a qualified technical support by a team of skilled technicians to solve your current operating and analytical issues, AGS proposes e-service support, as herein described.

We are currently providing daily services to 5 refineries, for a total amount of no. 12 Amine Units, no. 13 regenerators and no. 38 washing columns using DEA, MDEA, AND FORMULATED solvents, equal to 2000 cu.m./h and 3000 cu.m. of solvent hold-up.

As follows are all the services we can provide from remote:

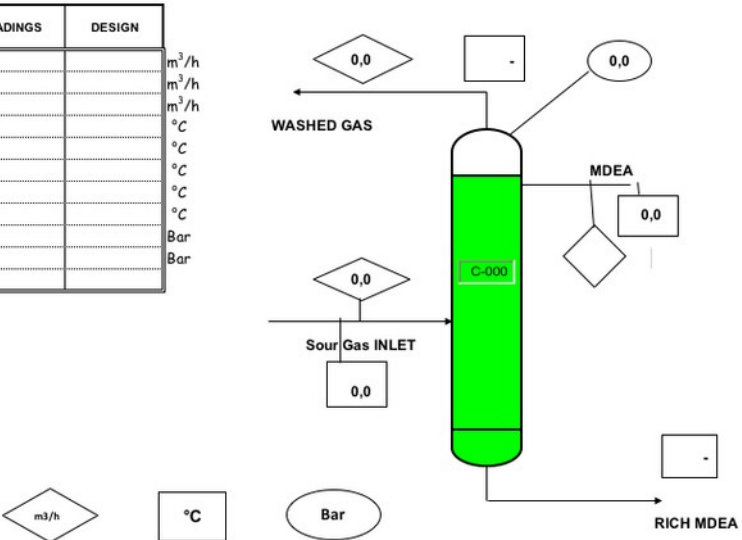
**1.0. OPERATING CONDITIONS MONITORING**

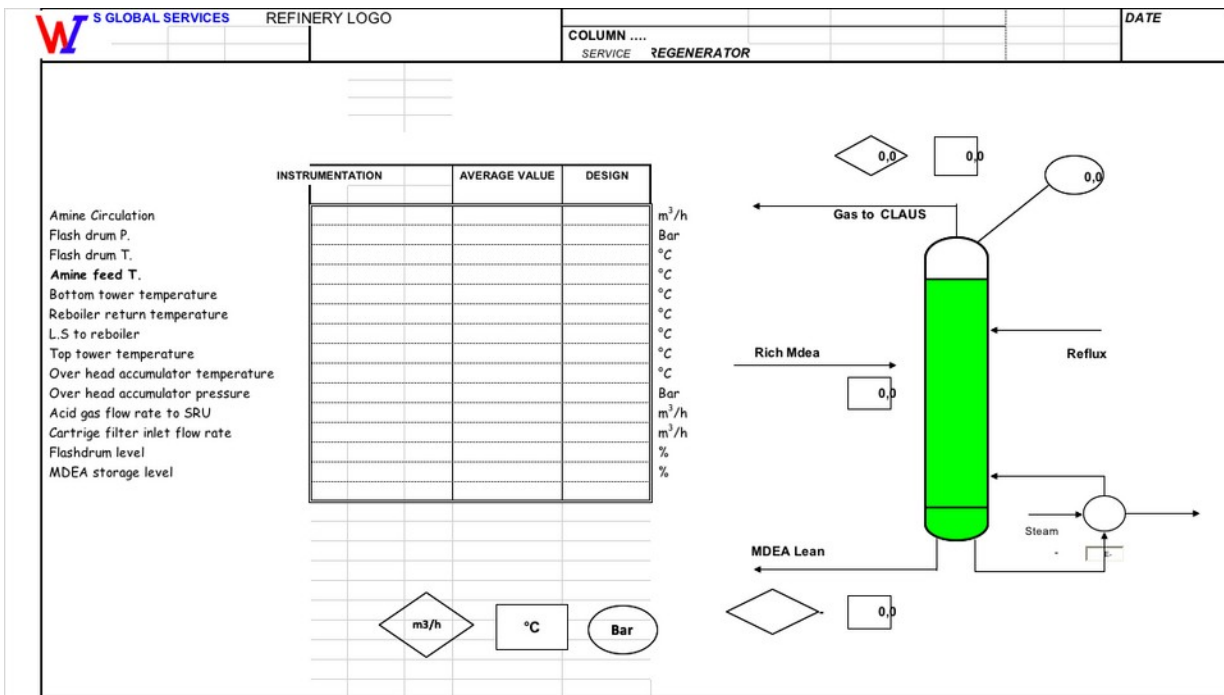
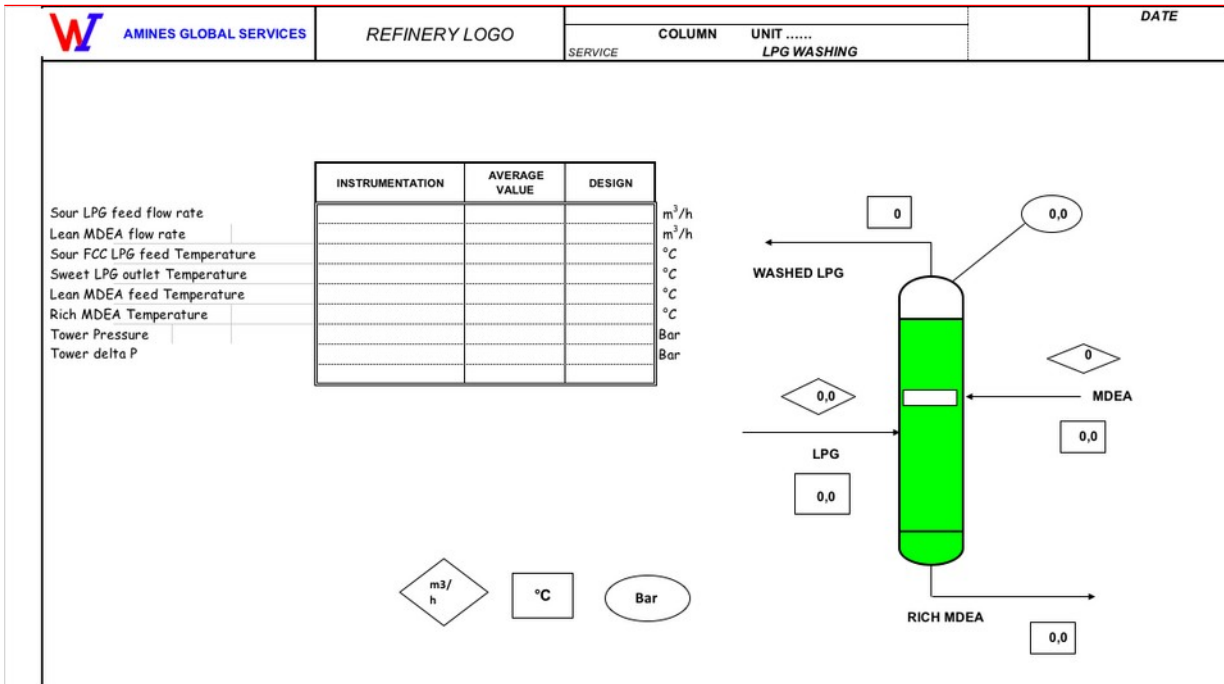
We propose the following actions: your process supervisory system can generate a file that contains only the tag numbers and related values of your amine units. This file will be sent to us and will be assessed by us on the tables hereunder for each washing column and regenerator.

 <b>AMINES GLOBAL SERVICES</b>	REFINERY LOGO	COLUMN	DATE
		SERVICE	

TAG	READINGS	DESIGN	
Sour gas inlet flow rate			m <sup>3</sup> /h
Sweet gas outlet flow rate			m <sup>3</sup> /h
Lean amine flow rate			m <sup>3</sup> /h
Sour gas feed Temperature			°C
Sweet gas outlet Temperature			°C
Lean amine feed Temperature			°C
DeltaT amine-gas			°C
Rich amine outlet Temperature			°C
Tower Pressure			Bar
Tower DeltaP			Bar



Our recommendations and suggested actions needed for a good operation of plants will be reported by us in the above tables and returned to you.



## 2.0. SOLVENT ANALYTICAL PERFORMANCE

We can agree on the frequency of shipment to our lab in Taranto of your Regenerators' Lean Amine sample.

We will send you by means of international couriers our SAMPLE KITS containing boxes and relevant MSDS for USED AMINES with shipment instructions .

As soon as we receive your sample and within 4 days from receipt, we will email you the analytical results reported in the SOLVENT ANALYTICAL REPORT hereunder.

In the analytical report you will also find our comments and assessments regarding the solvent quality with suggested actions to be taken.



**Gas Treating Products & Services**



Amine Global Services

**SOLVENT ANALYSIS REPORT**

Location		Sample Date	
Plant or Unit name		Received	
Sample Number		Completed	

**Sample Properties**

Amine Product		Sample Source	
Sample Opacity		Sample Color	
Solids, ppm		Sample pH	
		Conductivity $\mu\text{S}/\text{cm}^2$	

**Molar acid loading :**

CO <sub>2</sub> ppmw		CO <sub>2</sub> Loading mole/mole	
H <sub>2</sub> S ppmw		H <sub>2</sub> S Loading mole/mole	
		Total loading mole/mole	

**Amine Concentration, %wt**

Titration amine		
Chromatography MDEA		
Chromatography DEA		
Chromatography N-MEA		

Chromatography unknowns, as PG, wt%	
Chromatography bicine, wt%	

**Heat Stable Salts, %wt :**

Heat stable amine salts	
Inorganic heat stable salts	
Titration total heat stable salts	
Neutralized HSAS	
Calculated chromatography HSAS	

**Metals by HPLC**

Iron - Fe, ppm		Potassium - K, ppm	
Sodium - Na, ppm		Copper - Cu, ppm	
Chromium - Cr, ppm		Nickel - Ni, ppm	
Calcium - Ca, ppm		Magnesium	
Manganese, ppm		Zinc ppm	

**Ion Chromatography**

Acetate, ppm		Formate, ppm	
Chloride, ppm		Sulfate, ppm	
Oxalate, ppm		Phosphate, ppm	
Thiosulfate, ppm		Thiocyanate, ppm	
Glycolate, ppm		Propionate, ppm	

**Foaming**

As Received		Foam Height, ml	
		Break Time, sec	

**Comments :**

Comments area with multiple horizontal lines for text entry.

**Made by :**

Completed by :

Checked by :





#### **4.0 ONLINE PROBLEM SOLVING**

We can offer a specialized online support to solve the following problems arising from:

Foaming, hydrocarbons, HSAS contamination, corrosion, off spec of washed gas, high amine losses, high filters replacement, amine entrainment in washed LPG, mercaptans removal.

We suggest to arrange a video conference with your operators to discuss your problems and all the solutions proposed by us.

#### **5.0. VISIT TO YOUR PLANT**

In case of urgent issues, we are available to reach your plants within 3 days from your request.

#### **6.0. CONTRACT TERMS OF OUR SERVICE**

The support offered by us and herein described can comply with your needs. We can draw a contract defining all costs and charges tailored for your request.

You will find here below a typical contract proposal:

##### **6.1 MONITORING OF OPERATING CONDITIONS**

- For each adsorption column ..... Eur/month

- For each regenerator ..... Eur/month

Minimum contract time: one month

##### **6.2 SOLVENT ANALYTICAL MONITORING**

-Total cost for the SOLVENT ANALYSIS REPORT ..... Eur/each

##### **6.3. COMPUTER SIMULATIONS COST**

- For adsorption columns ..... Eur/each

- For regenerators ..... Eur/each



#### 6.4. ONLINE PROBLEM SOLVING

- Video conference: LUMP SUM .....Eur/each

#### 6.5. URGENT AND EMERGENCY INTERVENTIONS AT YOUR PLANTS

- Lump-sum price for each day .....Eur/day

- Travel, food, hotel expenses .....at cost + 5%

Do not hesitate to contact us. We will be pleased to offer our best quotations.

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For further information, visit our website [www.amine-gas-treatment.com](http://www.amine-gas-treatment.com)