King Fahd University of Petroleum and Minerals
Electrical Engineering Department
EE399 Summer Training

Prepared for

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Introduction:

As a student in the fourth year of the college of science engineering, I spent 8 weeks in an industrial company. My training program was at Arabian Agricultural Services Company (ARASCO). It was a good chance for me to see how theories and theoretical expressions represent in the plants. Many information and ideas has become clearer than before. Also, it gives me a good chance to work with other engineers from different department as a team. We share some ideas to find the best solution for different problems.

About ARASCO:

It was established in 1983 as a pure agricultural services company. The company has always been on the top 100 Saudi companies list since the first time it was published (ranked 53rd in 2006). The table below shows some data about ARASCO's main facilities, products and capacity.

Facility	Capacity	Products/services
Kharj Industrial Complex		
• Feed Mill	650,000 MTPY	Mash, crumbed, and pellet feed
• Corn Refining Plant	60,000 MTPY	Starch and glucose
• Extruded Feed Plant		Extruded feed
• Premix Plant	57,600 MTPY	Vitamin and mineral premixes
Dammam Feed Mill	1,000,000 MTPY	Mash, crumbed, and pellet feed
Poultry Processing Plant	43,200,000 birds/year	Fresh and frozen poultry
IDAC Laboratories		Chemical and pathological analysis and technical services
DCP Plant	30,000 MTPY	DiCalcium Phosphate
Logistics	A fleet of 200 trucks, hopers, dumpers, and flatbeds	
Dammam Port Facilities		Stevedoring, bulk handling and storage
Cold Store		
Alemar International		Veterinary products, fertilizers, fungicides, insecticides, herbicides, etc.

ARASCO (Feed Mill):

There are several steps for any product before becoming ready to use by animal:

Step 1:

Basic materials are entered to plant through 2 ways which are (Hand Intake) and (Truck Intake). This step is known as Intake Step.

Step 2:

The materials are loaded in bucket elevator until they reach Drum sieve.

Step 3:

Then, The materials pass through Drum Sieve to allow just wanted materials pass through it and reject the rest.

Step 4:
Next, the materials pass through Magnetic Sieve to attract iron elements from the materials.

- Step 3 and 4 are known as Cleaning Step.

Step 5:

Then, the materials are weighted by transfer scale.

Step 6:

After that, the materials go to very important step which is Grinding. The materials grind to very small parts through hummer mill and roller mill

Step 7:

The materials go to Rotor Distributor to distribute every material in its Bin.

Step 8:

The materials go to Dosing Scale to weight the materials which will be product.

Step 9:

The materials go into 2 Boxes A and B by bucket elevator

Step 10:

The materials go into pellet sieves which have slope to sieve the material.

Step 11:

Next step, materials go into Post Grinding to grind the rest materials that didn't grind in step 6.

Step 12:

Mixing Step is very important in every product. In this step some materials are added by hand (Hand Intake).

Step 13:

The materials go to homogenizer to add Molasses into materials.

Step 14:

In this step, the materials are formed which is called Pelletizing Step.

Step 15:

Then, the steam is added into the materials. After that, the materials pass through cooler.

Step 16:

Finally, the product is complete. There are 2 ways for any product either it is bagging or goes through Buck Load Out.

The number of transformers and required power for plant:

- *The plant has three transformers.*

	Primary Voltage	Secondary Voltage
Transformer # 1 (2000 KVA)	13600	400
Transformer # 2 (2500 KVA)	13800	400
Transformer # 3 (2000 KVA)	13600	400

The plant needs 7.4 M Watt which is supplied by SEC. However, if there is a problem with electricity, ARASCO has three generators. Each one of them can produce 650 KVA.

Control Room:

This room is the brain of plant. So, it gives instructions to all the plant from small part to largest part. The employees in this room control the speed of motors and how much substances should be added to each product. There are tow screens in ARASCO that show all process from intake step up to final step as a product. There is hundreds of sensor with different types spread over the plant. These sensors are connected with control room's computer. The employees watch the screen and if there is any red alarmed, they make some changes to fix the problem or they call the maintenance department. Since it is the brain of plant, any small damage in control room's computer will affect the production.

Some Examples of Sensor:

Sensors are the eyes of controller to the plant. They are used for a wide range of functions in automated systems, such as to measure pressure, force and distance, detect the presence and/or position of work

pieces and the completion of process steps. There are three types of sensors in ARASCO which are:

1) Capacitive sensor.

2) Inductive sensor.

3) Rotary sensor.

Some Examples of motors:

There are many different sizes of motors in ARASCO. They represent the motion of plant. They spread over all the plant and give the life to machines. I listed some of them below with their pictures:

- Homogenizer's motor

- Pelletizing's motor

Main Distribution Board (MDB) Room.

This room is important, because it contains circuit breaker panel. It is used to distribute the power from transformer into Motor Control Circuit (MCC).

Advantages of summer training.

During my summer training, I learned many things that related to my studying in KFUPM. I spent tow weeks in control room.

These weeks gave me idea how controllers deals with problems.

I used control room's computer to fill information that necessary to the content of wanted product. When any problem is occurred

from smallest part up to largest part, alarmed signal is shown in its computer and we call maintenance. Also, I spent some weeks in maintenance department in ARASCO. It was good chance for

me to deal with some problems by hand . When employee from control room call us, I went with technician employee

and I learned from them how I can discover the problem and how I can solve it.

My supervisor in ARASCO requested from me to write a job order about any thing we did. Also, I read manual books for some equipment in plant and I wrote Check Lists and this is example:

- Tube Screw Conveyor
  - Yearly : 1)Carry out electrical control function
    2) Carry out general check of all electrical equipment screws fittings and insulation.
- Homogenizer:

  Yearly: Check the entire electrical installation.

The most important notice in must machines is as following:

1) check function of electric control including emergency stop and control of the acknowledgement in the control center
2) Check the settings of the motor protective devices
3) General check of all electrical connections and screwed fittings and also check insulation

Conclusion:

The summer training was good chance to discover how my studying is applied in real life. It makes connection between theory things and experimental things. It learns us something that we cannot learn it from books or lectures and it approaches some hard information. Also, dealing with different engineers and sharing some idea with them will help you to gain more experience.