

SHOW US THE SPARK

WE'LL IGNITE THE PASSION

**JOIN OUR INTERNSHIP
PROGRAM (6 TO 8 WEEKS)**

SHAMS
Power Company



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STUDENT TRAINING PROGRAM DETAILS

SHAMS INTERNSHIP PROGRAM (6-8 WEEKS)



ENGINEERING DEPARTMENT

INTRODUCTION

This program offers engineering students the opportunity to get exposed to and gain hands-on experience in the field of renewable energy and in particular in solar thermal power plants (parabolic trough technology). It targets young engineers who are interested in pursuing a career in the power sector, generation in specific and would like to understand how their field of study is utilized in this sector. They will also have the opportunity to have a better understanding about how different engineering fields are integrated and utilized in a power plant (electrical, mechanical, control, process, chemical and information technology).

OBJECTIVES

The program has the following main objectives:

1 To expose the trainee to the different aspects common to various industrial environments (power generation, petrochemical plants, oil & gas, etc.) which usually are not presented in a sufficient level during engineering studies but yet are considered as basic knowledge that any engineer working in an industrial environment should have. This includes, but not limited to, safety practices, reading and understanding process & instrumentation diagrams (P&IDs) and piping isometric drawings, distributed control system, enterprise asset management software (for example Maximo), single line diagrams (SLDs), non-destructive testing techniques (NDT), etc. In addition, a general introduction about Shams Power will be given that will provide the trainee with a proper level of understanding of the plant's main equipment and processes.

2 To give the trainee a chance to work on and contribute in solving real-life tasks and problems related to his field of study and/or interest. This will not only contribute positively to his knowledge and experience, but will also contribute to Shams by solving a problem, enhancing a process, optimizing performance, etc.

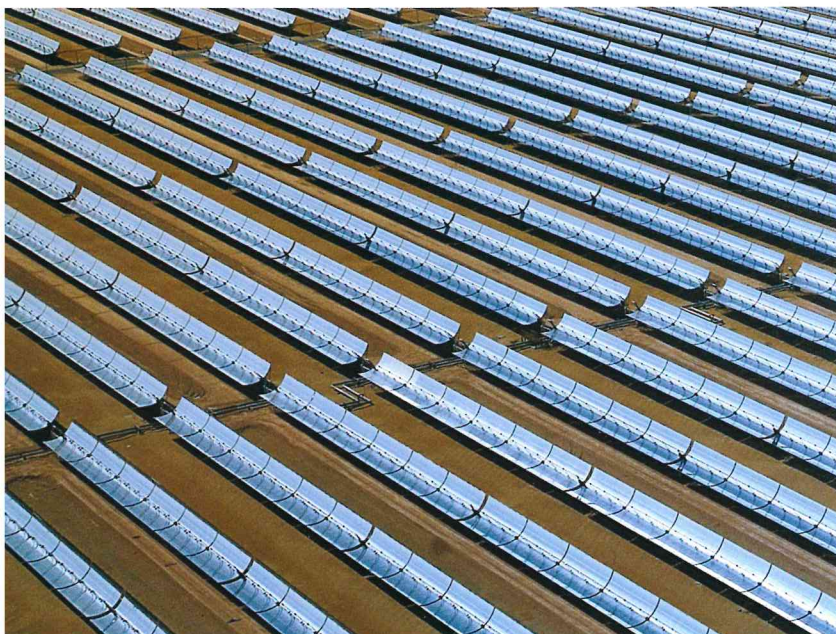
PROGRAM OUTLINE

Process and Performance	Analysis of power block performance. Development and use of tools/Wmodels.
	Analysis of solar field performance. Development and use of tools/ models.
	Analysis of plant parasitic (electrical self-consumption) and definition of action plans for optimization.
	Identification and implementation of plant improvements.
Distributed Control System	Logic diagrams interpretation and implementation of control changes.
	Plant and systems communications. Design and status follow-up.
Chemistry	Water-steam quality control. Sampling strategy. Dosing strategy.
	Plant laboratory operation.
Inspection	Developing an inspection plan. Type of inspection activities.
	Follow-up of inspection results for plant/equipment integrity control.
IT	Power plant IT necessities and control.

EXPECTED OUTCOMES

The following are some of the expected outcomes of this training program:

- 1** At the end of the training period the trainee will possess a good level of understanding of the different types of renewable energy with emphases on solar thermal technology (parabolic trough in particular).
- 2** The trainee will be accustomed to the different aspects of working in industrial environments.
- 3** The trainee will have a good level of understanding of Shams Power main equipment and processes.
- 4** The trainee will have assisted and contributed (partially or fully) in one or more engineering department task(s).





MAINTENANCE DEPARTMENT

INTRODUCTION

This program is focused on Power Plant Maintenance, this includes preventative maintenance and corrective maintenance. The technician targeted population will be future Technicians or Engineers who want to gain field experience and practical understanding in maintenance activities of electricity generation plants or oil industry.

OBJECTIVES

Interest for the Intern: the Intern will discover the reality of various maintenance activities associated with the industrial installation that is the power block. It is a very interesting and rare way to acquire detailed knowledge of the pieces of equipment of an electrical power block, the care they need, and the damages they face.

Activities: the Intern will be fully integrated within the Maintenance Team consisting of the following specialty: Electrical, I&C or Mechanical. The Intern will participate in all normal activities led by Technicians. The Intern will be hands-on with the tools, in the limits of his knowledge and competencies. The maintenance teams manage all the maintenance activities on all the pieces of equipment on the power block of the Power Plant. This clearly is a field internship.

EXPECTED OUTCOMES

Progress of the internship: after the first week dedicated to the introduction to Shams and to safety, the Intern will be integrated in the team, sponsored by one Technician. Progressively, he will be expected to participate increasingly in various activities of maintenance of the power block. Eventually, if condition allows, the Intern could be entrusted dedicated jobs.

This will be achieved by assigning the trainee in one of the engineering department sections. Each of the sections will have different topics that the trainee may work on (partially or fully). The level of task(s) that will be assigned to the trainee and the expected outcomes will depend on the knowledge level and the interpersonal skills of the trainee and on the period that the training took place.

End of internship presentation on what was learned will be required.



PROGRAM OUTLINE

Maintenance Philosophy	General maintenance approach. Activities done in-house vs. services subcontracted. Organization of staff / shift patterns.
Preventive Maintenance	Preventive maintenance for follow-up of equipment conditions. Identification of issues before turning critical. Development and implementation of a preventive maintenance plan. Reports preparation.
Corrective Maintenance	Corrective maintenance for issues resolution to ensure adequate plant availability. Reports preparation.
Shutdown Maintenance	Effective preparation of scheduled outages.
Warehouse Planning & Coordination	Coordination of activities. Arrangement of manpower, spares, consumables and external services.
	Warehouse organization. Definition of stock levels and inventory control.
Mechanical	Mechanical maintenance of the plant. Rotating and static equipment. Mechanical workshop activities.
Electrical and I&C	Electrical and I&C maintenance of the plant. Calibration of equipment follow-up. E&I&C activities.
Solar Field	Solar field maintenance. Maximization of field availability. Cleaning vehicles maintenance.
Reliability Program	Type of unreliability events. Analysis and impact estimation. Definition of action plans.



OPERATIONS DEPARTMENT

INTRODUCTION

This program is for training within the power plant control room operations. The targeted population will be future Technicians or Engineers who want to gain field experience in Operations activities of electricity generation plants.

OBJECTIVES

Interest for the Intern: the Intern would discover the reality of the operation activities and how the plant is operated daily. It is a very interesting and rare way to acquire detailed knowledge of the plants and how the system operates on a day-to-day basis depending on weather conditions.

PROGRAM OUTLINE

Operation Philosophy	Plant operation modes. General operation strategy. Daily start-up and shutdown activities.
Permit to Work (PTW) System	PTW preparation and issuance. Type of permits and certificates (hotwork/work at height/excavation/confined space). Coordination of activities. Roles and responsibilities. Identification of hazards and mitigation. PTW forms.
Lock-Out Tag-Out (LOTO) System	LOTO / Positive isolation of equipment for safety at work. Type isolations. LOTO required accessories. LOTO forms.
Control Room Operations	Monitoring of equipment conditions from control room. Implementation of operation strategies. Alarm management. Coordination with electrical grid operator (TRANSCO).
Power Block Operations	Monitoring of equipment conditions in field. Identification of abnormal conditions (leaks, noise, etc). Preparation of equipment for maintenance activities (isolation, drainage, etc.).

ACTIVITIES

The Intern will be completely integrated in the Operation Team in the control room and expected to actively participate in all day-to-day plant operations. The Intern will be hands-on with the tools, in the limits of his knowledge and competencies. The Operation teams manage all operation activities in the plant, and the intern will be expected to assist in limited cases by completing tasks individually.

- Preparation of the systems, condition check of the plant, day-to-day routine check in DCS
- Realization of job within the control room, as part of a team
- Completion of the job, reporting and troubleshooting in case of emergency
- Learn how communications are transferred to LDC and different parties

EXPECTED OUTCOMES

Progress of the internship: after the first week dedicated to the introduction to Shams and to safety, the Intern will be integrated in the team, sponsored by one Supervisor. Progressively, he will be expected to participate increasingly in various activities of operation in the control room. Eventually, if proven to be competent, he will be responsible for taking multiple tasks in the department. At the end of the internship, the Intern will have to make a presentation reflecting all that was learned and understood during the course of the internship.



HEALTH, SAFETY, SECURITY & ENVIRONMENT DEPARTMENT

INTRODUCTION

An internship in the Health, Safety, Security & Environment (HSSE) Department is intended to give students a deep understanding regarding the importance of health and safety at the workplace, particularly in power plants with hazardous chemicals machinery. Interns will take HSSE courses conducted in the plant and will learn about real life scenarios where HSSE matters affected plant operations as well as human lives.

OBJECTIVES

Understanding the importance of HSSE as being an integral part of the company's culture that needs to be followed and supported daily on-site. To have in-depth understanding of government requirements and regulations pertaining to health, safety and environment. To have a firm understanding of basic firefighting systems, fire trucks, safety codes of practice for each aspect of the power plant.

PROGRAM OUTLINE

Anomalies, near misses and incidents	Safety related events. Root Cause Analysis (RCA) of safety events and definition of action plans.
Firefighting system	Firefighting strategy/philosophy: deluge system, sprinkler system MX200 system, foam system, fire pumps, hydrants and fire fighting vehicles.
	Firefighters competencies and training.
Emergency response	Emergency Response Plan (ERP). Definition of roles and responsibilities. Typical emergency scenarios. Drills plan: in-house and with third parties.
Environmental monitoring	Control and follow-up of equipment emissions.
	Control and follow-up of waste water disposal.
	Control and follow-up of waste material disposal.
	Air quality follow-up.

EXPECTED OUTCOMES

Students are expected to complete their internship in the HSSE Department with a firm understanding of the various aspects of HSSE at the workplace. They will be required to demonstrate basic knowledge on how to use firefighting equipment and other safety and protective gear.

Students are expected to understand the objectives and reflect their understanding within the end of internship presentation.

