

## Introduction

1. 1. // started its activities in .....n 1998 and in 1999 assigned ..... as it is representative starting one of the greatest ..... projects ..... refinery. The time as predicted for this project was estimated 3 years for purchase and construction in which I as industrial engineer in the position of planning worked in this project for a duration of 10 months approximately only between Feb. 20, 20..... to Dec. 21, 20.... in the design and engineering stage. I worked in this project during the design stage as a professional industrial engineer. //Representative address // is //.....Owner and directing manager of // Company is Mr//.

## Background

1. 2. Objective of this project was design and construction of a gas and petroleum //in // with the capacity of 300000 barrels of crude heavy oil and products such as propylene, liquid gas, benzene, jet fuel, gasoline, coke and sulphur. The project was joint with 3 companies of EIED, ODCC and OIEC in cooperation to // Company as contractor from one side and // Oil Refinery Company as client.
1. 3. // Refinery project had assigned three parts of engineering, purchase and construction to four above mentioned each having the following shares: 55% EIED, 35% ODCC, 5% OIEC and 5% //. // was responsible for design and engineering, purchase and construction of 3 units from refinery units composed of Sulphur production unit, Coke production unit and Flare unit. I should mention that due to some problems including lack of financial supply for the project as the project was supposed to be completed with 3 years, it took more than 8 years and still is half completed and only had 5% physical progress.
1. 4. During my presence in // Company, in // project, I worked in basic engineering phase and then detailed engineering phase. In //, there were about 25 people working permanently in different unit which I have shown in the following chart clearly:
1. 5. The// project objective as I mentioned was constructing a refinery with the capacity of refining 300000 barrels of crude and transforming it to products such as propylene, liquid gas, benzene, jet fuel, gasoline and etc. the project procedure was as following steps which my job description also includes them:
- Layout drawings showing the area in access for design

- Geotechnical report booklet (indicating type of soil, and strength rate of the construction site)
- Design, purchase and construction standards
- List of vendors approved by client
- Receiving technical documents and standards as approved by client in different parts that contractor was obliged to follow them (for example in ASME standard and etc.)
- Receiving procedures, and work performance methods in different parts such as reporting, documents delivery method and how to calculate project progress

after receiving the abovementioned documents by the contractor, I started basic engineering in team namely the overall design of project was created.

## Personal Engineering Activity

1. 6. In the beginning of the project, I prepared the detailed schedule plan according to the determined time period in the contract that this stage probably is the first and most important step in project in order to control and supervise the works. The main duties of the planning unit that I worked in it as industrial engineer – planning expert were preparing WBS (Work Breakdown Structure) of the project – first and second level of it were already defined and more levels of work breakdown according to the contractor need could be done. I prepared the scheduled plan according to the received procedures from client and also approved WBS. In //////////////// project, according to the contract terms, I used Primavera Enterprise Version 5.
1. 7. For the purpose of preparing schedule plan, first I obtained list of activities from each working unit along with time required for each activity as well as required manpower. For example, in engineering unit, I received list of engineering documents along with required man-hour from process unit in engineering part of the project. As planning department, I matched time and list of work existing in he contracts so that deficiencies and contradictions are removed. Then I compared suggested time for work conduction with similar completed activities in previous projects so that there is not a big difference. In one case, for preparing a mechanical datasheet document, there was need for 20 man-hours.
1. 8. I used my experiences from previous projects. After completing works list and conduction time, I entered activities. Using Primavera, and according to the defined breakdown structure in the software, after recording all activities, I had a separate meeting with each of the working units and created relationships between activities of that specific unit with the activities of the unit itself and or other teams' activities. Then I allocated resources defined from before in access (project management had provided to the planning unit) in the software. Then I compared written plan to the contract set time and if it was more than the time defined in the contract, I reduced time of that activity by allocating more resources and or working and adding up working hours.
1. 9. In case the obtained time was less, by increasing time of performing critical activities, I increased time of project so that risk of not doing the project activities on a timely manner was reduced. Moreover, resources allocation rate was also taken into account so that in case there

was a shortage, in order to obviate shortcomings, I started planning increasing working hour and or temporary recruitment as solutions that I applied.

1. 10. After removing the mentioned problems, I sent them to the project manager for comments and inspection. After receiving project management comments and removing them, I sent them to OIEC Company. After merging the report with the other two companies and coordination of schedule, the final one was sent to the client. Client experts considered the received plan and after, I held the coordination meeting for removing ambiguities and considering comments with all the other companies. After application of plan comments approved by both parties, all parties were obliged to follow it to the end of project.
1. 11. I allocated weight factor to each of the activities in order to calculate and prepare progress report according to probable costs for each activity – I divided costs of each activity to total cost of all activities. I should mention that weight of both primary levels were announced by client. I prepared reporting formats from working units according to the scheduled plan. I prepared and sent periodical reports on a monthly and weekly basis to the project manager using MS Excel software.
1. 12. I included different items in my reports composed of activities done in the past, new activities, work progress, plan deviation from reality, work progress diagram in different levels, delay reasons, concerns and problems as well as solutions and suggested plans for obviating problems.
1. 13. I followed up and received reports from different working units for preparing work progress report. I participated also in meetings with planning management in relation to issues of project control.
1. 14. One of the big problems that occurred during my presence was delay in the schedule that made client worried. Delay in engineering design resulted delay in other parts of the project and considering that ////////////// project had national scale could result in economic problems on the entire country industry and economy and following the people life and moreover, the project was followed by high ranking political authorities of the country making the project more vulnerable.
1. 15. Therefore, project management requested explanation of this problem and solution to prevent it happen again. I as an experienced industrial engineer in cooperation to project control and planning management with repeated checks and careful consideration of all received reports from different units and having meetings and listening to the explanations from executive managers and working unit, using my communications skills, I found out that delays root has several key documents that listed as following: piping plot plan for units, process flow diagram and piping and instrument diagram.

1. 16. Considering the fact that these documents were counted as key and basics documents as main pre-requisite for other parts, therefore not receiving the finalized and approved documents by client would result in delay in other departments. In order to solve this problem, in the first stage, in consultation to the project management, I requested an urgent meeting with the presence of all related people (process group and piping group) with other managers in the project and during the meetings everyone talked and expressed comments and problems. At the end, after clarification of comments on all parties, I decided to conclude the comments and viewpoints and reconsider and correct the documents.
1. 17. In the next meeting about 4 days later, I reviewed corrected documents and considered all comments in the next meeting. Only couple of trivial comments remained, however to prevent delay in other parts, I suggested that if comments do not affect other parts, I send the outcome documents for start to the other departments that was agreed by members. Moreover, in order to compensate the created delay, working hours increased so that in shortest possible time, documents are prepared and sent.
1. 18. After solving the first problem in order to prevent its re-occurrence, in the continue of the project, using accessible resources and also experience of the experienced and professional colleagues in our team, and books such as Total Project Control, Devaux, Stephen A. (1999) and PMBOK, we made the decision that I extract list of team activities as pre-requisite for many of other activities.
1. 19. The next problem that I challenged in this project as a professional industrial engineer was preparing engineering documents considering lack of human resource. The solutions that I proposed as a professional industrial engineer were recruiting new forces, using overtime and required rewards, outsourcing documents preparation and scoping out part of work from working front of the company. I used my experiences, knowledge in industrial engineering, educational background and resources that I had available.
1. 20. After considering the contract, CBS (Cost Breakdown Structure) according to the company finance and credit, the fourth solution that I figured out as a professional industrial engineer was scoping out part of work from company working front which was not economic and I eliminated it. Finally, I applied a combination of solutions one, two and three as abovementioned, namely wherever needed I used trained and professional forces and for other parts, I considered rewards and overtime work to expedite the work; for the parts out of the company capacity, I outsourced the documents preparation.
1. 21. For calculations and analyses, I considered CBS contract and also inspected schedule of document preparation according to the company experiences. I applied resources such as Ms Excel, Primavera and Scurve software.
1. 22. Regarding the environment preservation, as one part of the work in sulphur unit was part of my responsibilities so I separated sulphur from raw materials as part of works in this unit, in

case if I did not prepare engineering documents on a timely manner, finally it could result in environmental problems from sulphur burning as non-recoverable materials.

1. 23. For the abovementioned problem inspection and study, as industrial engineer – planning expert, I attended different meetings with the project manager and also directing manager that finally I prepared WBS with an optimized structure and proportionate to the project and company work. Moreover, for a better perspective, I participated in meetings with company engineering manager and also different engineering departments leads including process, mechanical, civil, electrical and instrumentations as main responsible authorities in preparing documents. In these meetings, I prepared an estimation of man-hours required along with man-hours.

## Summary

1. 24. My suggestion was instead of 100% completion of documents and then sending them, we prepare them with minimum 80% accuracy and send it as 00 revisions to client that had two advantages, first we would be informed from client comments in earlier time and second speed in sending the documents and obtaining work progress that had both practical positive effect and psychological effect on client and us as contractor.
1. 25. For the purpose of clarification and better understanding of the problem and finding the best solution as graph, I used Primavera software and modelled it. Then I extracted bottlenecks and also using accessible solutions sent the results in the form of a report to project manager.
1. 26. The project overall speaking was a successful one in design not considering the delay problems I mentioned in background that was not our fault. I care about team work especially in consultation and after all I learnt that team review and experienced people comments really work.

## Introduction

3. 1. ///////////////, I worked for /////////////// which has office in /////////////// Project manager was Mr. /////////////// and the project name was /////////////// /////////////// located in the site of The /////////////// field in the ///////////////. Client of project was ///////////////. and total duration of project according to the contract was 2 years. I was present in the project for a term of 1 year and I was industrial engineer in charge of planning and control of project. I worked for on a full time basis and as a professional industrial engineer. May 201// to Jan. 201///, was the time that I worked in this project or the project performance period. This project started in April 201/// and completed in April 201//////// ////////////// year.

## Background

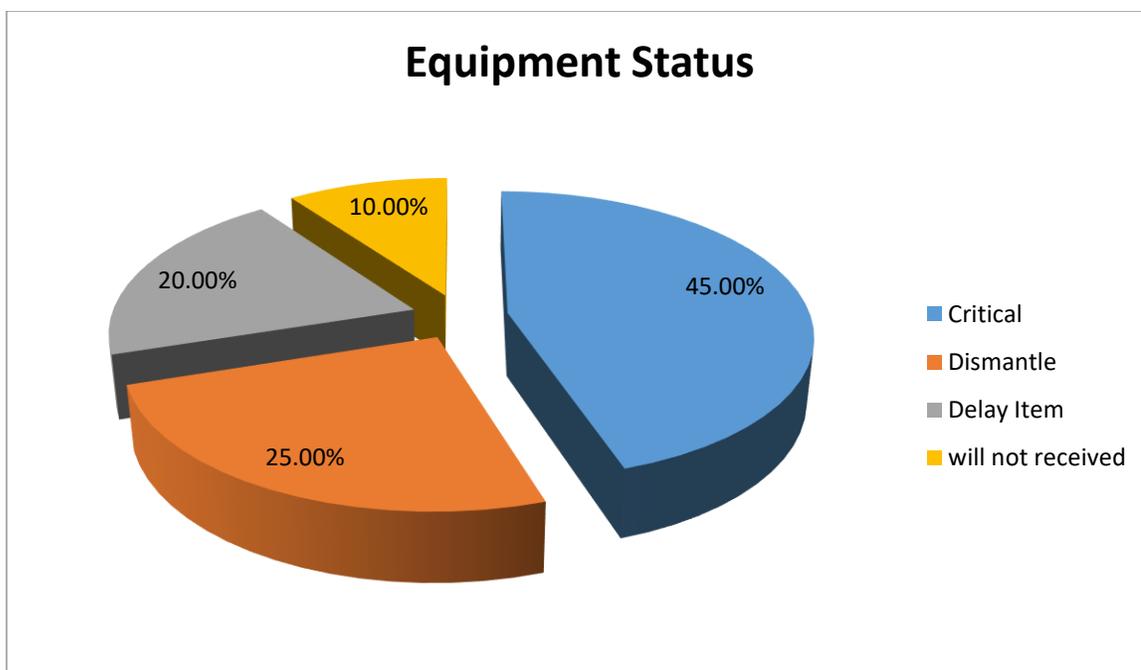
3. 2. The ////////////// of offshore platforms deals with the changes necessary on SPP1 and SPD1 platform topsides and SPB1 bridge in between to raise the production from 800 MMSCFD (average current production assumed) to a minimum of 1 000 MMSCFD, all the production coming now from SPD1. In the case of any lack/decrease of production from SPD1, a part of the production could be delivered from SPD2.
3. 3. The main changes for REVAMPING on SPP1 platform topsides consist of //////////////; Slug Catcher: Change internals; Level control valves: Change control valves on produced water & condensate services. Dehydration inlet separator: Change internals, Gas coolers -Condensate coolers: Change heat-exchanger vessel with suitable material (corrosion issue), Glycol coolers: change heat-exchanger vessel for higher duty, Glycol / Glycol Heat-Exchangers :Change for higher duty, Glycol contactor: Change internals, Glycol regeneration unit: upgrade to increase TEG flowrate to 14.6 t/h, Glycol regeneration unit: Add charcoal filters, Glycol reboiler heater: Change for higher duty, Glycol booster & recirc pumps: Change for higher duty piping: necessary piping works including connection of new 16 inch production header from SPD1.
3. 4. Project manager of this project as was my manager in my ex working place and considering his satisfaction from my work, he invited me on this project as industrial engineer in charge of planning and control for cooperation. Considering that my specialty was industrial engineering, I was assigned the following duties and responsibilities:
- Preparing WBS of project according to the contract and working items and getting them with the supervision system and client for the purpose of monitoring the activities
  - Preparing overall schedule of project considering the contract content
  - Preparing overall plan and preparing S curve of project progress percentage according to the time determined in the contract
  - Preparing internal formats of human resources report and machineries report as well as report of completed activities on a daily basis separated by each discipline and providing them to the units

- Preparing weekly, biweekly, and monthly reports to be presented to the client and supervising system with the formats as requested by client of project
  - Working in team and attending meetings as required
  - Using industrial engineering software for different purposes in the project
3. 5. Organizational chart of the project was as following; I cooperated in planning as industrial engineering:

## Personal Engineering Activity

3. 6. During the first stage as start up, I collected information; before formally visiting the site, in order to get introduced with generalities of the project, I requested for contract and studied all its aspects. After classification of document, I revised schedule plan which was prepared at the time of tender; I also followed and participated in meetings with executive departments such as mechanical, structural, piping, electrical, instrumentations, quality control and HSE so that not only I coordinate with them my future activities but also I understand their working methods and develop better communication within the team and get properly introduced to them myself.
3. 7. In the schedule plan of the project during the tender time, some factors such as safety, climatic condition and etc. were not considered. During the execution time of the project, considering that HSE factors such as welding and cutting on the platform which required providing proper conditions to prevent sparks coming from it were not considered resulted in prolongation of execution time more than the anticipated one and result in delay of project execution process.
3. 8. Moreover, during the days that the sea was stormy, and sea waves did not let relative stability for vessel in addition to platform preparation for accommodation and storage and transfer of equipment to platform, practically in those days, it was not possible to conduct the project activities. In order to prevent work stoppage in bad climatic conditions and considering the fact that prediction of climatic conditions of the week ahead was accessible, I suggested project manager that during days with bad weather, we station personnel on the platform form day before so that on the days that vessel had to cast off and cut with the platform, people were on the deck and work is not stopped. I suggested these people stay on the vessel a night before as their lack of presence would stop the entire works and activities of the project.
3. 9. For parts that required welding, and cutting in special conditions such as covering the area with fireproof tarpaulins and lack of tarpaulins on the platform, I suggested that until tarpaulins are supplied, we transfer parts that have the capacity of displacement on the vessel and welding and cutting operations are done so that I save time. I suggested this as a professional industrial engineering caring about time saving in project. In studying of the project problems, I looked for different alternatives; I applied experiences of other professional engineers at work. I cared about the time and costs of the activities and looked for plans and activities saving time and cost in project.

3. 10. For better understanding of the conditions of the project, I followed up and attended in meetings with HSE managers and executive managers of client for better interaction and coordination of operations and in order to expedite the operations execution in a safe manner. Some of the manufactured items did not reach to the site and I had to ask for some meetings for solution of this problem. Considering lack of discipline and order as well as incoordination of work multiplied with sanctions in import of cargos purchased from abroad including items such as high size valves and circulation pumps, there were delays that came up in schedule plan of project. I was assigned by project manager during that specific meeting to think out of executive solutions to minimize delays and their impacts and find solutions to continue the works without installation of some equipment that we were pretty sure of their delays.
3. 11. There were limitations that resulted sometimes in stoppage of work that some of them that I have listed include the ones emanating from climate that resulted in hard sea conditions for working. Considering the fact that work was on equipment in a well that was in service from before and was one of the country's gas supplying sources; therefore, the only possible time for doing the project was summer since at that time gas consumption rate had a drop. Therefore, I planned for such activities performance in summer time as the ripe time.
3. 12. As a professional industrial engineer, I prioritized the executive activities of the project. I used opened parts from project site. There was the possibility to delay some of the operations without making negative impact on re-commissioning of the platform comparing to before. I planned different tasks prioritized according to a time sheet plan for the project.
3. 13. Following the order of project manager, I was assigned to coordinate between different units including executive, QC, procurement and other units so that using the existing facilities, I find executive solutions to prevent delays in re-commissioning of the platform. After a meeting that I held with procurement unit experts of the project, I identified equipment that reached the platform after determined time for commissioning. I obtained list of items and in separate format, I identified components required for commissioning different parts. I held a meeting with QC departments and executive department so that I identified re-usable equipment.
3. 14. I inspected the documents and in order to get a better comprehension of the equipment use and their displacement in the project procedure, I performed inspection and studied the procedures and project drawings including P&ID. For prioritization of installation stages, I used Primavera software and I prepared a diagram after that indicated overlap of required equipment, site used equipment and critical items as following:



3. 15. For some of the valves including several types of valves, there was no overlap and for this reason, I was assigned by project manager to negotiate with client and find this equipment in similar projects that did not have priority or were in the stock. Fortunately, I found a list on the side of client as existing items in POGC company warehouse that was main client of project and I was assigned as supply coordination expert for these items. In fact I managed inventories and materials application in the project as a professional industrial engineer.
3. 16. As I mentioned before, considering the fact that extracted gas from this project supplied part of Iran different regions gas consumption and any kind of delay in commissioning would result in local problems and in cold areas making problem in danger of cold weather specifically resulting in negative social impacts on the national scale. Moreover, if the project did not commission on a timely manner, regions with shortage of gas had to use from alternatives such as gasoline, oil or wood that would have resulted in wider damages on the environment and ecosystem and production of poisonous gases. I as a professional industrial engineer dealt with the above mentioned challenges regarding environment, society and safety.

## Summary

3. 17. I worked in a very good cooperation with QC, project engineers and procurement department of the project as a professional industrial engineer. Always after I investigated the problems I proposed solutions using my knowledge in industrial engineering and my previously obtained understanding in the field. The project though faced some delays and exceeded the

estimated costs, my utmost effort as a professional industrial engineer was to reduce the costs on other parts to compensate and manage the costs and budget. This project for me as an almost fresh industrial engineer at those times was a great achievement and I could tackle many problems and I believe that it opened new insights for my future engineering activities as a professional in the field.

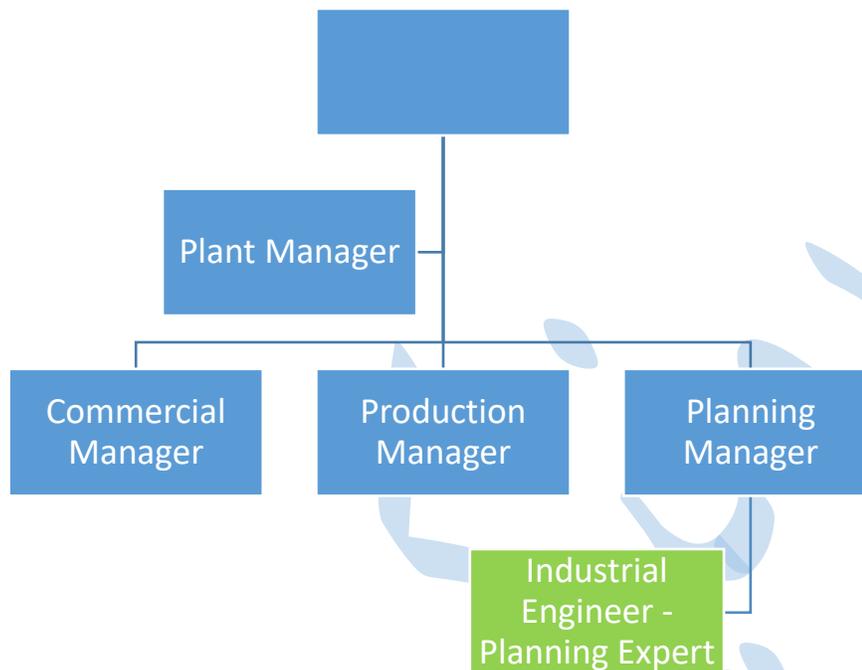
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## Introduction

2. 1. As an industrial engineer, I worked for //////////////// Company which has office in ////////////////; //////////////// manager and project manager was Ms////////// and the project call is engineering, purchasing, manufacturing, transportation and installation of cooling tower. The project had multiple sites in different locations all over ////////////////. Client of project was different industries including petroleum, gas, petrochemical companies and copper industries and etc.
2. 2. Contractor of project was //////////////// Company and the total duration of project according to the magnitude of project was more than 6 months. For a period more than 3.5 years I worked in this project and as industrial engineer my position was in planning and control of project. Since Feb. 2013, I have been working in this project and //////////////// Company as a full time industrial engineering professional. Project is still under process.

## Background

2. 3. Project is design, manufacturing and installation of industrial cooling towers with capacity of over 300 cubic meters. Considering my good working resume and also my good scores in the company entrance exams, I was invited to work in //////////////// as industrial engineer – planning and control considering my expertise which was industrial engineering.
2. 4. As a professional industrial engineer, I handled variety of engineering responsibilities in this project including but not limited to following:
  - Cooperating and supervising on the definition of works breakdown structures and project activities
  - Preparing project primary plan according to the subject and contract description with observation of time period as mentioned in contract and obtaining approval from client
  - Control, follow up and monitoring on physical progress and temporal progress of working teams' activities
  - Preparing management and project progress reports
  - Supervising and control of performance on all personnel
  - Participating in intra organizational meetings and providing required reports
  - Coordination and communication between client
  - Preparing projects invoices according to contract with client
2. 5. Objective of project was supplying required cooled water for production units and the organizational chart is as following in this project that I worked as a professional industrial engineer:



## Personal Engineering Activity

2. 6. As the first step, I started my activities by collecting information as project control and planning expert from beginning of preparing tenders up to execution of project. I was control expert in project from proposal presentation to full execution of project. In order to get informed of the work, I studied project documents that I had received from clients such as material requisition, procedures, project specification and standard drawings.
2. 7. The first problem in the project was lack of discipline and classification of documents and lack of supervision on the personnel performance. Considering lack of proper classification and maintenance of documents and also since job descriptions were not clearly defined, in some cases there were parallel performance of works and in some cases even documents were sent mistakenly; other revisions were sent.
2. 8. As an experienced industrial engineer, I prepared information databanks using Microsoft Access software or SQL Server and or by purchasing document classification software from pertinent software corporations. Considering mismatch of pre-designed software as designed by software corporations with this company needs and classification method and also high costs of purchasing such software, I decided to prepare this databank inside the company. Amongst the software such as SQL and Access and considering better introduction of personnel with Access

software and also considering that it was user friendly, I decided to prepare the data bank using MS Access software. I applied from my computer technology knowledge, internet, Google search as well as comprehensive instructions booklet of Access.

2. 9. Considering proper electronic classification of documents, I prevented printing and considering lesser use of paper, one of my professional engineering acts in this project was preserving the environment this way. I developed proper as required communication to other departments and communicated to IT management for infrastructure preparation. I communicated to directing manager in order to verify execution of software in the company and trained personnel for use of the software using my mentoring and training skills as a professional and experienced engineer.
2. 10. The company lost many of projects that they wanted to win in tenders considering of being single source. According to the facts that I found out that for estimation of price of some of the items such as FRP (fiberglass) parts of project, only one single source was used for inquiry and high costs of vendor and putting some costs on the items result was that final price of the project became really high and final price in some cases was about two times rival attendants in tenders that mainly resulted in losing tenders by the company. I held meeting with the authorities for discussing this problem further.
2. 11. In order to reduce the final costs of cooling towers construction using fiberglass structure, I decided to create fiberglass parts production line in the plant after several meetings we had with management. I studied all aspects, and in this regard, I conducted various studies, inspections, researches and consultations to other production lines in other plants so that, I prepared a comprehensive report for as such purpose.
2. 12. In order to reduce the final costs for construction of cooling towers using fiberglass structure, in cooperation to design team, after estimating expenses and costs of commissioning, in cooperation to fiberglass manufacturing company, we started manufacturing required machineries for production of required profiles.
2. 13. After financial estimation, I selected 3 models of machines as final options. Then I along with plant production manager prepared a layout for feasibility study of placement of machineries in the plant that considering size and production method of each of machines, we selected two models. Then I consulted to design team regarding quality of output production of each of machines that finally mentioned machine after preparing all reports and providing them to the company management and obtaining their approval, the considered one was selected. I applied resources such as standard of designing cooling towers (CTI). To solve the mentioned problem, I used Excel for estimating costs and preparing diagrams of financial comparison and I used AutoCAD also.
2. 14. I worked jointly with other members of the team also; I worked with project quality control and design team superintendent for technical feasibility study; I had a great team work

with plant production management throughout the process of work execution feasibility study and worked with directing manager for finalization and financial feasibility study of the work.

2. 15. Standards that I applied were Specs of project and CTI standard. I consulted in cooperative manner to electrical, mechanical and civil engineers for designing the machine and production. I worked back to back with civil engineers in approval and presentation of viewpoints about production dimensions. I worked technically with mechanical and electrical engineers in inspection of drawings and documents pertinent to machine manufacturing and preparing viewpoints for a better making a better design.
2. 16. Through different methods and strategies, I improved my industrial engineering knowledge in line with my individual and professional objectives. I studied books and specialty journals in industrial engineering to increase my knowledge and learn new methods and technologies and apply them in troubleshooting, optimization, investigation. I searched in internet to progress the project in an update manner. I attended seminars and conferences adding to my experience and expertise. I studied and learnt Office and Excel software for design purpose.

## Summary

2. 17. In my viewpoint this project despite problems and troubles through proper solutions was successful coming to its predetermined objectives in customer satisfaction during the determined time line and estimated costs. In this project I gained tons of work experience, specialty, and personal professional knowledge some of them as below: Teamwork experience and communications skills in an effective manner with team members, Formal contacts experience in the framework of organizational hierarchy via methods such as phone conversation or face to face, holding meeting or correspondence, Specialty experience related to the industrial engineering in the area of research, planning and production control which are some of the main and principle branches in the industrial engineering and manufacturing companies activities.
2. 18. I developed experience and skill in encountering unanticipated problems and introduction to the troubleshooting methods by brainstorming method and patience against problems and working coincidences. I gained good experience in application of pure and academic theoretical knowledge and sciences in the area of industry, globe, and the real world of today, critical use of them considering the unanticipated industrial conditions