PROJECT MANAGEMENT
A CASE STUDY IN
CONSTRUCTION INDUSTRY

A THESIS

Submitted to the Faculty of Management
and the Graduate School of Business Administration
of Bilkent University
In Partial Fulfillment of the Requirements
For the Degree of
Master of Business Administration

by

Ahmet Murat KOLAITIS

June 1993

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I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

Assist. Prof. Can Şımga Muğan

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

Assist. Prof. Gülnur Muradoğlu Şengül

I certify that I have read this thesis and in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of the Master of Business Administration.

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Approved for the Institute of Management Sciences

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ABSTRACT

PROJECT MANAGEMENT:

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CONSTRUCTION INDUSTRY

Ahmet Murat KÖMÜRÇÜ

M.B.A. in Management

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Project management finds a wide application area in construction industry. In this thesis, a case study is carried out to determine the importance of project management, and to find how TimeLine Version 5.0 (a project management software) and S-curve can help the managers for a better application of project management.

Keywords: Project management, construction management, critical path method, planning and scheduling.

ÖZET

PROJE YÖNETIMI:
INŞAAT SEKTÖRÜNDE
BIR VAKA ÇALIŞMASI

Ahmet Murat KÖMÜRÇÜ
Yüksek Lisans Tezi, Işletme Bilimleri Enstitüsü
Tez Yöneticisi: Yard. Doç. Dr. Çan Şımga Muğan
Haziran 1993, 105 Sayfa

Proje yönetimi inşaat sektöründe geniş bir uygulama alanı bulmaktadır. Bu tezde, proje yönetiminin önemini belirlemek, ve TimeLine Version 5.0'in (bir proje yönetimi programı) ve S-eğrisi'nin daha iyi bir proje yönetimi uygulaması için yöneticilere nasıl yardımcı olabileceğini bulmak amacıyla bir vaka çalışması yapılmıştır.

Anahtar Kelimeler : Proje Yönetimi, inşaat yönetimi, kritik yol metodu, planlama ve zaman çizelgesi.

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I want to express my gratitude to my family. I wish also to thank to my brother Oğuz, and Şerap for their endless supports.

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1. INTRODUCTION

Time and money are the crucial resources for all industries in the world. Especially, in construction industry, firms have to manage time and money efficiently in order to be profitable and competitive. Competitiveness and profitability can be increased through a better application of project management. This enables the firms to make better estimates of time and money consumption, to follow the development of their projects, to evaluate themselves and to correct any repetitive mistakes.

In construction industry, most of the companies have powerful project management softwares. They are mostly used only for initial scheduling because in most contracts it is a must to submit an initial work plan of the project. However project management does not mean only initial scheduling and budgeting. It continues from the beginning to the end of the project. It seems that in practice the spirit of project management is not well understood.

1.1 Aim and Scope of the Thesis

The aim of this thesis is to determine the importance of project management and to find how TimeLine Version 5.0 (a project management software) and S-curves , can help the managers for a better application of project management. For this purpose, a case study with a construction firm is carried out.

TimeLine Version 5.0 (TL5) is used as a tool in the study. Scheduling the project Critical Path Method (CPM) is performed by TL5. The results of CPM is presented and interpreted but the detailed description of CPM is beyond the scope of this thesis.

Besides project schedule, the project budget is also considered in the study. The progress of schedule and budget with respect to each other and to the initial estimates are tracked. S-curve is used to compare the progress of schedule and budget with the initial estimates.

1.2 Outline of the Thesis

The thesis proceeds in the following manner. In Chapter 2, related literature is reviewed. Project management

concept, project planning and scheduling, cost control, schedule control, schedule and budget updates are presented.

The analysis of the case is in Chapter 3. Data gathering, setting the baseline of the project with TL5, schedule and budget updates, cash flow to the contractor and discussion are the basic headings.

And in Chapter 4, conclusions and recommendations are provided.

2. A REVIEW OF THE RELATED LITERATURE

2.1 Need for Project Management in Construction Industry

The construction industry is a conglomeration of diverse fields and participants that have been loosely lumped together as a sector of economy. The construction industry plays a central role in national welfare, including the development of residential housing, office buildings and industrial plants and the restoration of the nation's infrastructure and other public facilities. The importance of the construction industry lies in the function of its products which provide the foundation for industrial production, and its impacts on the national economy cannot be measured by the value of its output or the number of persons employed in its activities alone (Hendrickson & Au,1989).

Good project management is essential for construction industry because of the importance of capital projects to the development of nations. In many developing countries construction alone accounts for about 10 percent of the gross national product and 50 percent or more of the wealth

invested in fixed assets. The importance of construction work in providing the physical facilities for development activities is indicated below (Austin & Neale, 1984):

Table I Construction Work in Developing Countries

DEVELOPMENT ACTIVITIES	CONSTRUCTION WORK
Agriculture	storage buildings, market facilities, irrigation, canals, rural access roads, land drainage
Education	schools, training centers
Energy	hydro-electric schemes, power stations, oil pipelines
Government Services	housing, hospitals, security and fortifications
Industry & Commerce	factories, offices, shops, storehouses
Mineral Development	minework construction, processing plants
Tourism	hotels, stadia
Transport & Communication	post and telecommunication buildings, airports, runways, roads, railways, ports, telecommunications stations
Water Resources	domestic water distribution and drainage, sewerage and sanitation, water supply (dams, boreholes)

2.2 Project Management Concept

Managing a construction project is quite different from managing a "steady state" organization. A project has a distinct beginning and end whereas steady state organizations run continuously (Austin & Neale, 1984). In other words, project management is distinguished from management of corporations by the mission-oriented nature of a project. A project organization will generally be terminated when the mission is accomplished. According to Project Management Institute, the disciple of project management can be defined as (Hendrickson & Au, 1989) :

"Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, quality and participation satisfaction."

2.3 Project Planning and Scheduling :

Project planning and scheduling entail the preparation of a formal "map" of how the overall project will be undertaken. A project is broken into a series of activities by the project planner that is called Work Breakdown Structure (WBS). And Work Breakdown Structure is sequenced to

show the relationships of the various activities which is known as network of the project. Work durations are assigned to each activity to schedule the project and enable the overall project duration to be determined (Adrian,1987). In scheduling and determining overall project duration, different techniques, such as CPM can be used. Description of these techniques are beyond the scope of this thesis. Anyone interested in scheduling techniques (CPM etc.) should see References.

From the standpoint of contractors, the planning process for construction projects consists of three stages. These stages take place between the beginning of the planning to the end of the project (Hendrickson & Au,1989).

2.3.1 *Estimate Stage*

Cost and duration estimates are developed by the contractor as part of the proposal to the owner. A careful and thorough analysis of different conditions imposed by the construction project design and by site characteristics are taken into consideration to determine the best estimate. This estimate defines the success of a contractor. The result of a high estimate would be to lose the job. Whereas, the result of a low estimate could be to win the job but to lose money in the construction process.

The initial detailed cost estimate is converted to a project budget . And CPM calculations can be performed with the available data at the beginning of the project to determine the initial estimate of project schedule. Both project budget and initial estimate of project schedule are used subsequently as a guide for management.

2.3.2 *Monitoring and Control Stage*

Control is an integral part of the project management process. It aims at the regular monitoring of achievement by comparison against planned progress. When deviations from planned progress occur, plans may have to be changed. Time is important and the control process should aim at the early discovery of any departure from planned course so that adjustments can be made in time to be effective. The control cycle is a continuous process throughout the life of the project (Austin & Neale,1984) as shown in Figure 1.

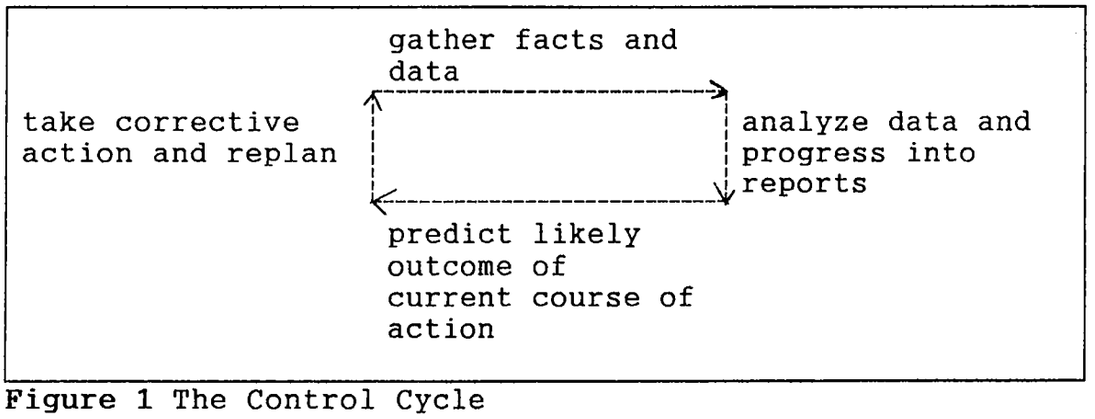

Figure 1 The Control Cycle

In construction planning, it is common to adopt an emphasis on control. From control, many contractors understand only the control of project schedule. However, most projects also requires consideration of cost over time. Therefore planning, monitoring and record keeping must consider both dimensions. Actual durations and ongoing costs must be tracked through the project. It is misleading to think that if the project is on schedule , the cost will also be on the estimate. When both cost and schedule is tracked over time, the integration of schedule and budget information is a major concern.

2.3.3 *Evaluation*

In this stage, actual progress are matched against the estimate. When a control report indicates that actual progress of an activity is deviating significantly from the estimate, management should first investigate to find and understand the reasons behind the symptoms reported. Furthermore, assumptions of the estimate are checked and the validity of the initial estimate is evaluated. And if necessary, new adjustments should be introduced in the future planning.

2.4 Cost control

Rising construction costs have increased the pressure on the construction industry to carefully monitor and control the flow of money at all levels. As a result, more emphasis is being placed on cash flow and cost control functions in construction management than ever before. In the planning phases, more through investigations and more accurate cost estimates are being required for those seeking financial backing. To remain competitive, contractors are being forced to monitor their cost accounts more closely and know where losses are occurring (Halpin & Woodhead,1980).

Cost control should aim at ensuring that the final cost of the project does not exceed the budget. An essential aid to cost control is forecast of the final cost, which is regularly revised to reflect the current state of the project. If deviations between this forecast and the project budget are observed, corrective action can be taken (Austin & Neale,1984).

2.4.1 *Cash Flow Projection*

The projection of income and expense during the life of a project can be developed from several time scheduling aids used by the contractor. One of the most commonly used and

simplest aids is the so called "progress curves" or "S-curves". The contractor develops this by constructing a simple bar chart of the project, assigning costs to the bars and smoothly connecting the projected amounts of expenditures over time.

Bars representing the activities are positioned along a time scale indicating start and finish times. For simplicity costs are evenly distributed across the duration of the activity.

The S-curve is nothing more than a graphical presentation of the cumulative expenditures over time. A curve is plotted below the time scaled bars through the points of cumulative expenditure. The name S-curve comes from the fact that the curve of cumulative expenditures has the appearance of a "lazy S". This general shape characteristic results because early in the project, activities are mobilizing and the expenditure curve is relatively flat. As many other activities come on line, the level of expenditures increases and the curve has a steeper middle section. Toward the end of a project, activities are winding down and expenditures flatten again. The points are connected by a smooth curve, since the assumption is that the expenditures are relatively evenly distributed over each time period. This curve is essentially a graphical portrayal of the outflow of

money (Halpin & Woodhead,1980).

2.4.2 *Cash Flow to the Contractor*

The flow of money from the owner to the contractor is in the form of progress payments. Estimates of work completed are made by the contractor periodically (usually monthly) and are verified by the owner's representative. Depending on the type of contract , the estimates are based on evaluations of the percentage of total contract completion or actual field measurements of quantities placed (Halpin & Woodhead,1980).

After the amount of work completed is determined, it is billed by the contractor to the owner. The owner will transfer the billed amount to the contractor's account with a delay. Since the progress payments are transferred in discrete amounts the income profile has a stair-step appearance.

2.4.3 *Cash Budgeting*

Money is a cascading resource that is encountered at various levels within the project structure. The owner or developer must have money available to initiate construction. The contractor must have cash reserves available to maintain continuity of operations during the time he is awaiting

The contractor directly controls the construction works. He assembles and organizes the necessary resources (Austin & Neale, 1984). From the contractor's point of view, money is the most important resource. Without money, contractor cannot acquire the other necessary resources. Therefore before his profit, a contractor must focus on the necessary working capital to run a contract. Even before building operations start, money is needed for hiring supervisory and administrative staff, hiring transport, buying materials etc.

The cash budget must include the identification of expected amount of cash receipts and disbursements, and the time at which various receipts and disbursements are to occur. The amounts of the receipts are determined by the contractor's total project bid. The disbursements are for the most part identified by the S curve.

The activity plan establishes times at which disbursements will have to be made. The timing of receipts of cash from the project owner are determined in part by the activity plan and in part by the owner contractor project payment agreement. On some government contracts it is possible for a contractor to obtain a cash advance to help with initial costs. Contractors must also bear in mind that it is usual for the client to retain 5 per cent or some similar figure of the valuation to be placed in a special

fund as an insurance. However it is hard for contractors to estimate their need for working capital properly because the payment for completed works are generally delayed.

The ability to obtain financing at a critical time in the project schedule often depends on how soon the company initiates the search for funds. The project's cash budget is essential for determining financing needs as a function of time (Adrian,1987).

2.5 Schedule Control

In addition to cost control project managers must also give considerable attention to monitoring schedules. Construction typically involves a deadline for work completion, so contractual agreements will force attention to schedules. More generally, delays in construction represent additional costs due to late facility occupancy or other factors. Just as costs incurred are compared to budgeted costs, actual activity durations may be compared to estimated durations.

Once estimates of work complete and time expended on particular activities are available, deviations from the original duration estimate can be determined.

In evaluating schedule progress, it is important to bear in mind that some activities posses float, whereas delays in activities on the critical path will cause project delays. In particular, the delay in planned progress at time t may be soaked up in activities' float (thereby causing no overall delay in the project completion) or may cause a project delay. As a result of this ambiguity it is preferable to update the project schedule to devise on accurate portrayal of the schedule progress (Hendrickson & Au,1989).

2.6 Schedule and Budget Updates

Updating is an activity that continues throughout the lifetime of a project. As changes or discrepancies between the plan and the actual occur, the project schedule and cost estimates should be modified. Periodic updating of activity durations and budgets is especially important to avoid excessive optimism in projects experiencing problems. If one type of activity experiences delays on a project, then related activities are also likely to be delayed unless managerial changes are made. Construction projects normally involve numerous activities which are closely related due to the use of similar materials, machines, manpower or site characteristics. Expected cost changes should also be propagated throughout a project plan. In essence, duration and cost estimates for future activities should be revised in

light of the actual experience on the job. Without this updating, project schedules slip more and more as time progresses (Hendrickson & Au,1989).

After each periodic update, the progress of the project has to be evaluated for control purposes. It is certain that a good presentation of the current data leads a better evaluation of the project progress by the management. Therefore a complete progress report should have five main components :

1.*Estimates* : either total, to-date, or this period, that provide a reference standard against which to compare actual or forecast results.
2.*Actuals* : what has already happened, either this period or to-date.
3.*Forecasts* : based on the best knowledge at hand what is expected to happen to the project and its elements in the future.
4.*Variances* : how far actual and forecast results differ from those which were planned or estimated.
5.*Reasons* : anticipated or unexpected circumstances that account for the actual and forecast behavior of the project and its operations, and especially that explain significant variances from the plan (Barrie & Paulson,1992).

Progress curves (S-curves) can express many aspects of project plans. Once the project is under way, actual progress can be compared with that which was planned. It is then possible to make projections based on the slope of the actual progress curve. Such projections, however, should neither be made nor interpreted without a good understanding of the reasons for deviations (Barrie & Paulson,1992).

S-curves can express in a graph four of the five necessary components of a complete report except reasons of deviations. So it is a simple and useful tool for managers in tracking the project schedule and budget.

3. CASE ANALYSIS

3.1 Data Gathering

The data for the application is obtained from Yasar Ozkan Muhendislik ve Muteahhitlik AŞ. The company is based in Ankara and operates both in Turkiye and abroad. In recent years, the company tried to apply project management techniques in every contract.

In the beginning of 1993, Yasar Ozkan AŞ has three large project under its contract. One of them is a factory construction in Russia. This project contains many activities that a typical construction project can have such as concrete works, painting etc. Furthermore, the construction did not started in January 1993. Therefore this project is chosen as a case for this thesis.

3.1.1. General Information about the Project

Gasprom , one of the largest state owned companies of Russia, is established to search, manage and distribute the

natural gas reserves of Russia. It is also responsible for selling natural gas to foreign countries.

Gasprom plans a large investment in order to manufacture huge capacity, high technology greenhouses. Gasprom will use these greenhouses especially in Siberia region to produce several fruits and vegetables for its workers' need.

A joint venture called Agri-Sovgas is established in 1991 to perform the greenhouse manufacturing. Gasprom is the owner of two third of this joint venture and a Netherland firm, Agri International, which has technology know-how in greenhouse manufacturing is the owner of the rest of Agri-Sovgas.

In 1992, Agri Sovgas starts to tender equipment and service purchases in order to realize the project. The whole project is divided into three parts :

1. First Factory
    1.1 Aluminum extrusion unit
    1.2 Boiler house
    1.3 Compressor building
    1.4 Administration building
    1.5 Pressing machine
    1.6 Greenhouse production unit

1.7 Substructures (water, gas, pressured air, hot water, sewerage, low voltage electricity network, factory roads, drainage system, waste water system etc.)

1.8 Factory connection roads

1.9 High voltage electricity connection system

2. Second Factory

2.1 Pipe and profile production unit

2.2 Galvanization unit

2.3 Warehouses

2.4 Substructures

3. Residence Buildings

3.1 Construction of villa type residence buildings

3.2 Construction of apartment type residence buildings

3.3 Construction of social buildings

3.4 Substructures

3.1.2. Parties of the Contract

Gasprom : A state owned company and the owner of the project.

Gasexport : Deals with any payment of Gasprom outside of Russia. Therefore Gasexport signs contracts with foreign companies.

Vhineshtroj Import Neftrestroj : A state owned company and the consultant of Gasprom.

Agri Sovgas : Executes the contracts signed by Gasexport.

Turan Hazinedaroglu & Yasar Ozkan Joint Venture : Turan Hazinedaroglu Insaat Ticaret ve Sanayi AŞ (Istanbul) and Yasar Ozkan Muhendislik ve Muteahhitlik AŞ (Ankara) formed a joint venture where each has 50% share. This joint venture signed a contract with Gasexport for the first factory except for parts 1.5 and 1.6 on December 29, 1992. The amount of the contract is $12,950,000. The contract will be completed in thirteenth months. And for parts 1.5 and 1.6 of the first factory another contract which has an amount of $9,732,000 was signed on May 22, 1993. Now, the total amount of contracts is $22,682,000.

In May 1993, TH & YO joint venture begins to negotiate with Gasprom for the construction of residence buildings which is the third part of the whole project.

3.1.3. Information about the site

The factory site is in Maloyaroslavets. It is located at 115 km south-west of Moscow with a population of 28000

people.

Obinish , one of the most important nuclear research center in Russia, is 15 km away from Maloyaroslavets. Therefore some of the subcontractors in nuclear industry are established in Maloyaroslavets. However, nowadays Obinish lost its importance, and some factories are shut down. Agri Sovgas purchased one of these factories. It plans to add new buildings while reconstructing the old ones. Reconstructed old buildings will be used as Aluminum Extrusion Unit, Administration Building, Boiler House, and Compressor House.

3.2 Setting the Baseline of the Project with TL5

After selecting the project, the first thing is to set the baseline. For such a large project it is very hard to apply project management without a computer and necessary project management software. A project management software called TimeLine Version 5.0 (TL5) is available at the company. It is a very powerful tool and provides a wide range of options to the user. Therefore TL5 is chosen as a tool in the analysis of the project.

3.2.1 Master Calendar Setup

Before starting to enter the activity names, the

calendar settings must be defined for the entire project. In the Calendar Settings Form, workdays, workweeks and fiscal or reporting year can be defined.

TL5 always provides default values for every type of settings, and it stores any change in settings and options. So it is not necessary to do the same steps for all projects if there is no change in the settings.

For the entire project, the calendar will be composed of 5-day weeks, 8-hour days and a schedule with one hour precision. TL5 can provide a precision of one minute however one hour precision is enough for our purpose.

Next, workdays and holidays are marked on the calendar by choosing dates from the menu. Both Russia and Turkiye are considered in marking the holidays.

As a last step, the workhours for the weeks is defined. 6 days and 48 hours are the workhours for the entire project. Each day, there are five workhours from 8AM to 13AM and three workhours from 2PM to 5PM.

3.2.2 Schedule Options Setup

After setting the master calendar as a second process

the Schedule Options must be set. TL5 provides a variety of options to the user. For instance, the descriptive name of the project may appear on all reports. The notes about the project such as assumptions, dates and even phone numbers can be stored. The " As-of Date " option is very useful in making calculations with respect to the current date, the start date or any entered date.

The descriptive name of the entire project is " Russia Project ". There are no notes stored in the option form. But weekly accumulated cost data is obtained from TL5 by using the " As-of Date " option. These data is used in developing the S-curves.

3.2.3 Schedule Data Entries

Once the settings are defined now it is time to begin entering information about the project schedule.

Main phases of the project are available in the contract but each phase must be divided into detailed tasks. As soon as a task has detail tasks, it becomes a summary task. This division is known as Work Breakdown Structure (WBS) and TL5 provides a WBS number for each task (See Appendix F).

In TL5, milestones can be used if the user wants to

define a specific point in the progress of the project. They are shown as tasks with zero duration. It is helpful to use milestones to flag key dates in the schedule. Milestones are represented by a different symbol. This makes it easy to recognize as an important date in the schedule. The end of the entire project is defined as a milestone (See Appendices C and E).

The WBS defines the main phases and detail tasks but without precedence relation it is impossible to define the project schedule. In defining precedence relations TL5 provides two types of dependencies. First one is *standard dependency* which means one task must end before the next one begins. The second one is *partial dependency*. With a partial dependency one task may overlap another or there may be a gap between the end of one task and start of another. In the current project there are 104 task dependencies (See Appendix G). Precedence relations in the project are defined according to technical requirements, the need of the owner and the availability of resources.

TL5 uses Critical Path Method (CPM) in scheduling the projects. It is beyond the scope of this thesis to explain the details of CPM. But it must be known that when optimizing a plan, it is useful to be aware of which tasks are critical. The critical path is defined as that sequence of tasks that

must all be completed on time to meet the schedule completion date. In other words, a delay to a critical path task will delay the schedule. TL5 "status" column makes it easy to see these critical tasks. Task on the critical path has a " C " in its status column. Non critical activities have floats and they can be delayed without delaying the completion date of the project. The types of floats are described in Appendices A and E . TL5 calculates task floats and they are presented in Appendix E.

At this moment, with the entered data TL5 can calculate the project schedule, however it can not say anything about the project budget.

3.2.4. Budget Data Entries

Now, it is time to enter resources and costs to define the project budget. It is possible to enter and change resources and costs at any time in TL5. However it is better to create a resource/cost list before entering the detail tasks. In TL5 , a resource/cost list item can be defined as resource, variable cost, unit cost or fixed cost. In the entire project , the resource/cost list contains 149 cost items and there is no resource. The contract duration is very limited and management does not want to deal with resource leveling problems. So, they accept to provide everything

needed during the project. Therefore everything is defined as a cost rather than a resource.

Each resource and cost has a form in TL5. The necessary information, such as name, type, rate, are entered to this form. "Rate profile" section enables the user to enter varying cost rates. "Keyword" section can be used in forming groups of resources. For instance, a report on resources in the same department can be prepared by using keyword option.

Until now, both schedule and budget estimates are determined. With these estimates the baseline of the project is set. As the project progresses and the plan is updated with information such as revised dates and durations, the baseline of the project will serve as a basis of comparison.

3.3 Schedule and Budget Updates

In TL5 there are three ways of updating the project. One way to update schedule information is using the task form. Second one is updating information with using "assist update". If assisted update is used then TL5 scans the schedule for tasks that should be started. A third way to enter progress information in TL5 is to type it directly into a spreadsheet cell.

After the project update, a set of information should be needed. TL5 layouts allow the user to display just the needed information. Predefined layouts can be used or new ones can be created. It must be noted that changing layout does not change the underlying information. It only displays different parts of the information that makes up the schedule. Different layouts are used in the presentation of the project (See Appendices B, C, E and F).

On April 19, 1993 and May 17, 1993 two updates were performed. Since the construction site is far away from the head office, the update data collection is not easy. So it is planned to update the project once a month. The progress of the project after the first and second updates on April 19, 1993 and May 17, 1993 can be seen in Appendix C.

The schedule update is performed by entering the percent completion of each task. It is not difficult to obtain percent completion of each task because site engineers can quantify this data. TL5 combines these entries and shows the progress of the whole project. It also converts percent completion data to the estimated cost. Both percent completion and the estimated cost are shown in Table II.

Table II Percent Completion of the Contract

Date of Update	April 19, 93	May 17, 93
% Completion	10.03 %	18.40 %
Estimated Cost	1,020,398	1,873,078

However, budget updates can not be done on the basis of each detail task and cost item. The accounting department can not supply a detailed cost data, whereas they provide a total amount of cost for each main phase of the project. The cumulative cost of each main phase at the end of each month is shown in Table III.

Table III Cumulative Cost in $

TASKS	March 31,93	April 4,93	May 31, 93
Genel Işler	70,000	110,000	170,000
Mobilizaşyon	670,000	1,300,000	1,900,000
Aluminum Ext.	40,000	280,000	680,000
Idare Binaşi	70,000	290,000	520,000
Kompreşor	-	-	70,000
TOTAL :	850,000	1,980,000	3,340,000

3.4 Cash Flow to the Contractor

The contractor, TH & YO joint venture makes estimates of work completed in each month. The estimates are based on evaluations of the percentage of total contract completion. This estimates are verified by the owner's representative. Then, the amount of work completed is billed by TH & YO joint venture to Gasprom who is the owner of the project. The payments for the amount of work completed are transferred to TH & YO joint venture in discrete amounts by Gasexport on the name of Gasprom. TH & YO joint venture generally gets the payments with a certain delay. It is customary in construction industry but the payments are not delayed more than the predefined delay by the owner. Payments by Gasexport are shown on Table IV.

Table IV Payments by the Owner

Payment #	Date of payment	Amount of payment
Advance (25%of total contract)	February 17, 93	$3,237,500
Payment # 1	April 15, 93	$187,000
Payment # 2	May 15, 93	$355,000

3.5 Discussion

It is only possible to comment on whether the schedule of the project is going as it is planned or not, if there is data about schedule progress. In a case, where the work completed is less than planned, the manager can not have an idea about how much money is spent to complete that amount of work. Perhaps the work is going slowly due to less spending. Or, although spending is more than planned, the work is going slowly due to other reasons. As a result, if a manager only tracks schedule progress, this will be misleading.

In this study, since both schedule and budget are tracked, there is a chance to compare them. Therefore, budget and schedule update results on the whole project base (See Table II and Table III) are combined in Table V. Figure 2 also shows the S-curve of the project where both schedule and budget updates are considered. Furthermore, Appendix D presents the detailed data in tabular form.

In Table V, estimated and actual values of schedule progress and budget are presented. Schedule and budget variances are also calculated. And it is seen that in the first update schedule variance is -3.25%. Negative value

Table V Budget and Schedule Update Results

Date	April,19 1993	May 17, 1993
Estimated % Comp (1)	13.28%	22.51%
Estimated Cost (2)	$1,352,053	$2,291,260
Actual % Comp. (3)	10.03%	18.40%
Estimated Cost for Actual % Comp. (4)	$1,020,398	$1,873,078
Actual Cost (5)	$1,565,667	$2,725,806
Schedule Var. (3)-(1)	-3.25%	-4.11%
Cost Variance (5)-(4)	$545,269	$825,728

means actual is behind the estimate. Whereas, actual cost is higher than the estimated cost. The difference is $545,269. In the second update, schedule variance is -4.11%. So, the difference between the actual schedule progress and the estimate is higher than the first update. If the reasons for slippage are not determined, the schedule will probably slip more and more in the future updates. It is also observed that the cost variance is $825,728 which is higher than the first update value. It can be concluded that both the cost variance and the schedule variance are increasing over time due to some reasons.

Furthermore, Figure 2 shows a graphical representation of the project progress. In Figure 2, **Baseline** is the initial estimate of budget and schedule. Left Y axis shows the percent completion of the contract. Right Y axis shows the

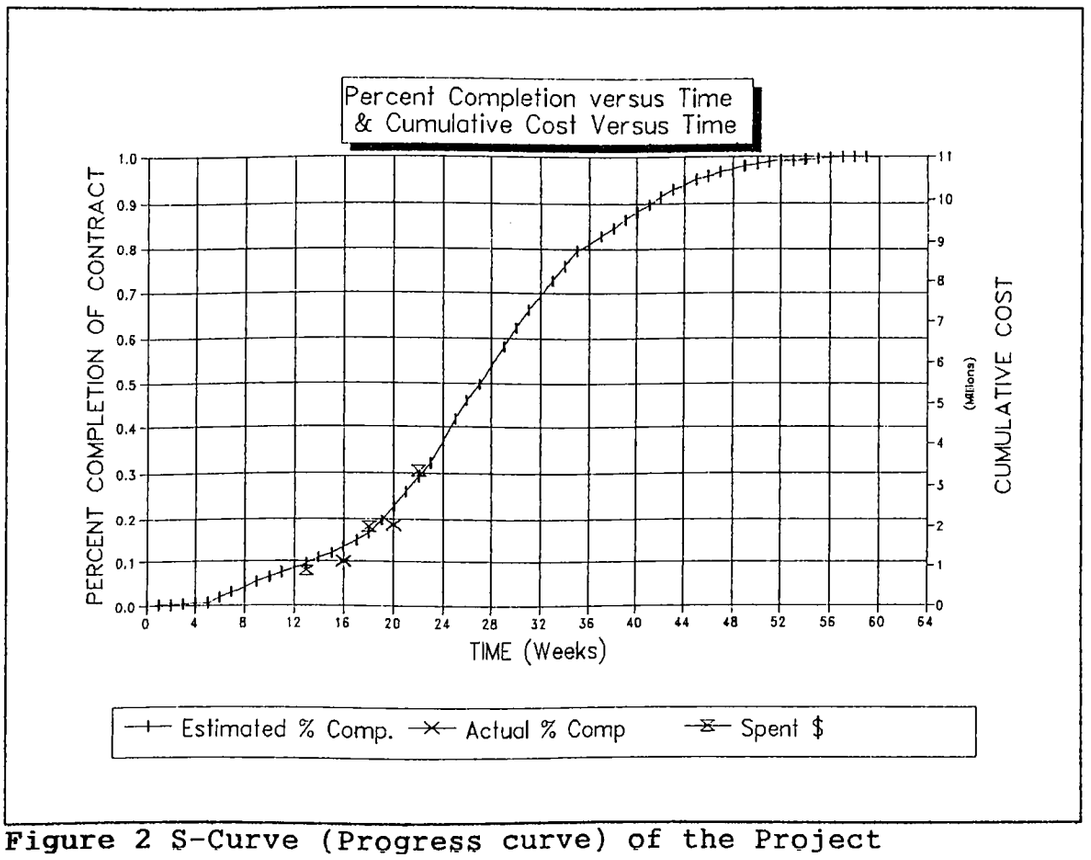

Figure 2 S-Curve (Progress curve) of the Project

cumulative cost of the project. **Actual % completion** is the schedule progress. And **spent $** is the total amount of spending.

In Figure 2 it is seen that schedule progress is slower than the estimated progress whereas updated budget is higher than the initial budget estimate.

Schedule progress is slow. Reasons for slow progress must be searched. Therefore, more detailed information on the activity base is needed. TL5 provides the necessary data. In Appendix C, from the first update on April 19, it is observed

that the tasks "Tavan Boyasi 1Ks", "Kazan Dairesi", and "Kompresor Binasi" were not started. In the second update on May 17 (See Appendix C), the above activities were still not started except "Tavan Boyasi 1Ks", in addition the tasks "Çelik Çati Boyasi 1Ks", "Ahsap Dogramalar", "Pencerelerin Degismesi", "Kanalizasyon Pompa Istasyonu", "Saha Kanalizasyon", "Gaz ve BA Hava Şebekesi", "Saha 10 KV Dagitim", "Saha Disi Isler" were not started. "Yeni Duvar Yapimi", "Ic Kapilarin Yapilmasi", "Çati Tecriti Tamiri", "Dis Çephe Boyalari" are tasks which are started early.

After determining the task names which are not started, the reasons are searched. It is found that "Çelik Çati Boyasi 1 Ks" did not start because the Netherland firm did not send the paint. "Ahsap Dogramalar" and "Pencerelerin Degismesi" did not start due to change in the material used. Other tasks did not start because the owner did not provide either the site or the necessary projects. Now, the reasons for the delay are known and corrective actions can be taken by management.

In Appendix E, the tasks with zero floats are on the critical path. These tasks are critical tasks and they are printed in bold. Management should be aware of that any delay in these tasks will delay the date of project completion. This information will lead the management to check if these

activities can be completed without a delay. If it is necessary, a proactive action is taken.

From the $-curve a second observation is that the spendings are a little bit higher than the budget. Although, the initial budget estimate is done, it can not be updated due to lack of detailed cost data. Because the accounting system can not provide cost data for each task. Since the cost data is limited with the main phases of the project, the reasons of deviation from the initial estimate can not be searched on task base. Main phase or phases which cause the deviation can be found. However it may be difficult to find the reason of deviation.

The income over time is known (See Table IV). While discrete amounts of payments are received, spendings are progressive as plotted in $-curve (See Figure 2). So cashflow of the project over time can be determined. This will lead the managers to define if there is a need for borrowing.

As it is described, $-curve is a simple and useful graph in controlling the whole project. Responsible managers should present the project progress to the top managers by using $-curves. Because top managers do not deal with details or they may have difficulty in understanding details. The whole

progress of the project and the cost badgers them. Nothing can express the progress of a project and its cumulative cost better than a S-curve.

Finally, TL5 is a very powerful and user friendly project management software. It saves the time of the managers. And while it saves time , it can make sophisticated schedule calculations and provide detailed information with a variety of options.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

By applying project management, the late activities are determined in early stages of the project, and necessary precautions can be taken. Therefore any possible delay from the completion date of the project can be known and prevented before it becomes more difficult to compensate. The major causes of delay are change in materials used, delay in material purchases from abroad, and late submission of construction sites and projects by the owner. The management knows these causes specifically and spends considerable effort to eliminate them. Furthermore, the management is aware of any delay in tasks on the critical path will cause a delay in the completion date of the project. Therefore, it has a tighter control on these tasks.

Since the schedule progress and budget are followed at the same time, the management can determine the amount of spent money for the amount of completed work. This enables the management to determine any change in the budget. Otherwise, the change in the budget can not be understood

until it occurs. And company may have a cash problem besides a loss due to change in the budget.

Schedule calculations are very difficult with hand in the case of large projects. So, TL5 is used in schedule calculations at the beginning of the project and at each update. It also provides detailed information with a variety of options. So, TL5 is found as a useful tool for the project managers.

And finally, it is concluded that S-curve is a simple and useful graph which shows the progress of schedule and the cumulative cost over time.

4.2 Recommendations

Data of the project is taken from the site and it is entered to the computer at the head office. This procedure takes time, so, there is a time lag between the collection of data and the project update. This causes a late recognition of project progress by the management. To eliminate this time lag, a computer system can be established at the construction site.

Furthermore, the current accounting system is not compatible with project management. The necessary changes in

the accounting system should be done to follow the budget on task and cost category bases. Therefore, "work element" accounting system can be chosen. In this accounting system, work elements represent the resources in a particular cost category associated with a particular project task. Work elements can be shown in a two dimensional matrix of tasks and cost accounts. However, some firms find it difficult to apply (Barrie and Paulson, 1992). In the absence of work element accounting system, cost associated with particular tasks can be estimated by summing expenses in all cost accounts directly related to a task plus a proportion of expenses in cost accounts used jointly by two or more tasks. The basis of cost allocation should be the level of effort or resource required by the different tasks. For example, costs associated with supervision might be allocated to different concreting tasks on the basis of the amount of work. The amount of work can be measured in cubic meters of concrete. With this allocations, cost estimates for particular tasks can be obtained.

Finally, top managers must be committed to the application of project management. This will stimulate everybody in the firm such as site engineers, accountants, workers, responsible managers to participate the application of project management. This will certainly lead to better results.

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APPENDICES

APPENDIX A

TERMINOLOGY

Activity : The basic component of a project . An individual task. Also, known as arrow in network representation.

Actual Cost : The cost realized for an activity.

Bar Chart (Gant Chart) : Graphical display of project schedule in activity base according to time.

Baseline Schedule : The planned schedule at the beginning of the project.

Budget : The estimate of cost required by an activity.

Calendar : The workdays and holidays are defined so this is considered in scheduling the project.

Critical Activity : An activity on the critical path and it has zero total float.

Critical Path : The series of activities in a project those have zero float. Any delay in this path cause the delay of the whole project. This path takes the longest time to complete.

Dependency : A relationship between two activities that constrains the dependent one.

Duration : The time needed for an activity completion.

Early Finish (EF) : The earliest date when an activity can finish.

Early Start (ES) : The earliest date when an activity can begin.

Event : The start or finish of an activity. Also known as node.

Float : The amount of time that the start or finish of an activity can be delayed without affecting the project finish date.

Free Float : The amount of time that an activity's early start can be delayed without affecting the early start of a successor activity.

Late Finish (LF) : The latest time when an activity can finish without affecting the project completion date.

Late Start (LS) : The latest time when an activity can start without affecting the project completion date.

Negative Float : The total amount of time that the start or finish of an activity exceeds the time allowed. It indicates a delay in the schedule.

Percent Complete : The portion of an activity that is completed.

Predecessor : An activity that must occur before another activity.

Progress : The completion of work.

Resources : Everything required to complete a project.

Schedule : A list of the activities with their start and finish dates needed to complete a project.

Slippage : Lateness determined by measuring the target start of an activity from its actual or current early start.

Successor : An activity that must occur after another activity.

Task : Activity. A unit of work.

Total Float (TF) : The total amount of time that the start or finish of an activity can be delayed without affecting the project completion date.

Updating : Recording the progress of a project at regular intervals.

Variance : The difference between the estimated and the actual values.

APPENDIX B

TASK RULES

Task Name : The full name of the task

Task Type : Fixed, ASAP (As soon as possible), ALAP (As late as possible), or Summary

Duration Method : The method used to calculate task timing (Duration-Driven, Effort-Driven).

Unavailability : Method used to calculate schedule a task across a period of unavailability (Split, Delay).

Start Date Restriction : The rule to be used when scheduling a particular Fixed Date task.

Force Critical : If "Yes" slack is removed and the task will become critical.

Start Date, User Entered : The entered start date, for fixed tasks only.

End Date, User Entered : User entered end date.

APPENDIX B

TASK RULES

Task Name	Task Type	Dur Meth	Unav.	Start Restric	Forc Crit	Entered Start	Entered End
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
SICAK SU SEBEKES	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
YAGM.SU ARITMA	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	2-Aug-93	17-Sep-93
MONTAJ ISLERI	ASAP	Duration	Delay		N		
SAH.YAG.SUYU TOPLAMA	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
GAZ VE BA.HAVA SEBEKESI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
SAHA 1 KV ELEKTRIKI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
SAHA 10 KV DAGITIM	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
SAHA YOLLARI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jul-93	18-Jun-93
CEVRE DUVARI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
SAHA DISI ISLER	SUMMARY				N		
DIS YOLLAR	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
10 KV.KABLO DOSENMESI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
GECICI KABUL	ASAP	Duration	Delay		N		
ISIN BITISI	ASAP	Duration	Delay		N		

APPENDIX B

TASK RULES

Task Name	Task Type	Dur Meth	Unav.	Start Restric	Forc Crit	Entered Start	Entered End
ELEKTRIK ISLERI	SUMMARY				N		
ANA PANOLAR	FIXED	Duration	Delay	No Sooner	Y	16-Aug-93	20-Sep-93
TALI PANOLAR	FIXED	Duration	Delay	No Sooner	Y	2-Aug-93	28-Oct-93
YAR.MEK.SITEM OTOMAZISYONU	ASAP	Duration	Delay		N		
KABLOLAR	ASAP	Duration	Delay		N		
KABLO TEFERRUATI	ASAP	Duration	Delay		N		
AYDINLATMA SISTEMI	FIXED	Duration	Delay	No Sooner	Y	31-May-93	15-Sep-93
YANGIN SINYALIZASYONU	ASAP	Duration	Delay		N		
YANGIN IHBAR	ASAP	Duration	Delay		N		
TELEFON SISTEMI	FIXED	Duration	Delay	No Sooner	Y	1-Jul-93	27-Sep-93
GUVENLIK SINYALIZASYONU	FIXED	Duration	Delay	No Sooner	Y	2-Aug-93	28-Oct-93
SAAT SISTEMI	ASAP	Duration	Delay		N		
RADYO SISTEMI	ASAP	Duration	Delay		N		
TOPR. VE PARATONER SISTEMI	FIXED	Duration	Delay	No Sooner	Y	20-May-93	7-Jul-93
IDARE BIN.BITISI	ASAP	Duration	Delay		N		
KAZAN DAIRESI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Apr-93	17-May-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
MEKANIK ISLER	ASAP	Duration	Delay		N		
MONTAJ ISLERI	ASAP	Duration	Delay		N		
KOMPRESOR BINASI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	Must Start	Y	1-Apr-93	2-Sep-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
MONTAJ ISLERI	ASAP	Duration	Delay		N		
POMPA ISTASYONU	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	2-Sep-93
MEKANIK ISLER	ASAP	Duration	Delay		N		
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
MONTAJ ISLERI	ASAP	Duration	Delay		N		
GIRIS KAPISI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
KANAL.POMPA IST	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-Jun-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
MONTAJ ISLERI	ASAP	Duration	Delay		N		
YAGMUR SUYU TANKI	SUMMARY				N		
INSAAT ISLERI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	19-Jul-93
ELEKTRIK ISLERI	ASAP	Duration	Delay		N		
MONTAJ ISLERI	ASAP	Duration	Delay		N		
SAHA KANALIZASYON	SUMMARY				N		

APPENDIX B

TASK RULES

Task Name	Task Type	Dur Meth	Unav.	Start Restric	Forc Crit	Entered Start	Entered End
ISITMA SISTEMI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	28-Aug-93
HAVALANDIRMA SISTEMI	ASAP	Duration	Delay		N		
SICAK VE SOGUK SU BORULARI	ASAP	Duration	Delay		N		
KANALIZASYON SISTEMI	FIXED	Duration	Delay	No Sooner	Y	20-Jul-93	28-Sep-93
SIHHI TESISAT	FIXED	Duration	Delay	No Sooner	Y	15-May-93	26-Jul-93
YANGIN KORUMA	ASAP	Duration	Delay		N		
BASINCLI HAVA BORULARI	ASAP	Duration	Delay		N		
GAZ BORULARI	ASAP	Duration	Delay		N		
ELEKTRIK ISLERI	SUMMARY				N		
ANA PANOLAR	FIXED	Duration	Delay	No Sooner	Y	10-Jul-93	2-Aug-93
YARDIMCI PANOLAR	ASAP	Duration	Delay		N		
TALI MEK. SISTEM OTOMAZISYONU	ASAP	Duration	Delay		N		
ALCAK GERILIM KABLOLARI	ASAP	Duration	Delay		N		
KABLO SAIR ISLERI	ASAP	Duration	Delay		N		
AYDINLATMA TESISATI	ASAP	Duration	Delay		N		
MOTOR SALTERLERI	ASAP	Duration	Delay		N		
YANGIN SINYALIZASYON	ASAP	Duration	Delay		N		
YANGIN IHBAR	ASAP	Duration	Delay		N		
TELEFON SISTEMI	ASAP	Duration	Delay		N		
SAAT SISTEMI	ASAP	Duration	Delay		N		
RADYO-SES DUZENI	ASAP	Duration	Delay		N		
TOPRAKLAMA VE PARATONER	ASAP	Duration	Delay		N		
ALUMINYUM BITISI	ASAP	Duration	Delay		N		
IDARE BINASI	SUMMARY				N		
INSAAT ISLERI	SUMMARY				N		
DUVAR YIKILMASI	FIXED	Duration	Split	Must Start	Y	1-Mar-93	12-Apr-93
DUVAR BOYASI	ASAP	Duration	Delay	Must Start	N	13-Apr-93	
ALU.ASMA TAVANLAR	FIXED	Duration	Delay	Must Start	Y	1-May-93	7-Jun-93
MARLEY KAPLAMA	ASAP	Duration	Delay		N		
SERAMIK KAPLAMALAR	ASAP	Duration	Delay	Must Start	N	13-Apr-93	
FAYANS ISLERI	ASAP	Duration	Delay	Must Start	N	13-Apr-93	
DIS CEPHE KAPLAMASI	ASAP	Duration	Delay		N		
AHSAP KAPILAR	ASAP	Duration	Delay	Must Start	N	17-May-93	
DIS ALU.KAPILAR	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	7-Jul-93
PENCERELERIN DEGISTIRILMESI	FIXED	Duration	Delay	No Sooner	Y	1-May-93	16-Aug-93
MEKANIK ISLER	SUMMARY				N		
ISITMA SISTEMI	FIXED	Duration	Delay	No Sooner	Y	15-Jun-93	5-Aug-93
VANTILASYON SISTEMI	ASAP	Duration	Delay	Must Start	N	13-Apr-93	
SU BORULARI	FIXED	Duration	Delay	Must Start	Y	15-May-93	12-Aug-93
KANALIZASYON	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	24-Jul-93
SIHHI TESISAT	FIXED	Duration	Delay	Must Start	Y	15-May-93	26-Jul-93
YANGIN DOLAPLARI	ASAP	Duration	Delay		N		

APPENDIX B

TASK RULES

Task Name	Task Type	Dur Meth	Unav.	Start Restric	Forc Crit	Entered Start	Entered End
1.SAHA ISLERI	SUMMARY				N		
GENEL ISLER	FIXED	Duration	Split	Must Start	Y	29-Dec-92	5-Feb-94
MOBILIZASYON	FIXED	Duration	Split	Must Start	Y	1-Feb-93	23-Jun-93
ALUMINYUM EKZTRUZYON	SUMMARY				N		
INSAAT ISLERI	SUMMARY				N		
DUVARLARIN YIKILMASI	ASAP	Duration	Delay	Must Start	N	19-Apr-93	1-May-93
YENI DUVAR YAPIMI	FIXED	Duration	Delay	Must Start	Y	5-Apr-93	29-Apr-93
DOSEME BETONU 1.BOLUM	FIXED	Duration	Delay	No Sooner	Y	1-May-93	18-May-93
DOSEME BETONU 2.BOLUM	ASAP	Duration	Delay		N		
DOSEME BETONU 3.BOLUM	ASAP	Duration	Delay		N		
DOSEME BETONU 4.BOLUM	ASAP	Duration	Delay		N		
DOSEME BETONU 5.BOLUM	ASAP	Duration	Delay		N		
SIVA ISLERI	ASAP	Duration	Delay	Must Start	N	30-Apr-93	
IC DUVAR BOYALARI	ASAP	Duration	Delay		N		
KOLON SAC KAPLAMASI	ASAP	Duration	Delay		N		
DUVAR FAYANS KAPLAMASI	ASAP	Duration	Delay	Must Start	N	30-Apr-93	
CELIK CATI BOYASI 1.KS	FIXED	Duration	Delay	No Sooner	Y	15-Apr-93	19-May-93
CELIK CATI BOYASI 2.KISIM	ASAP	Duration	Delay		N		
CELIK CATI BOYASI 3.KISIM	ASAP	Duration	Delay		N		
CELIK CATI BOYASI 4.KISIM	ASAP	Duration	Delay		N		
CELIK CATI BOYASI 5.KISIM	ASAP	Duration	Delay		N		
TAVAN BOYASI 1.KISIM	FIXED	Duration	Delay	Must Start	Y	15-Apr-93	19-May-93
TAVAN BOYASI 2.KISIM	ASAP	Duration	Delay		N		
TAVAN BOYASI 3.KISIM	ASAP	Duration	Delay		N		
TAVAN BOYASI 4.KISIM	ASAP	Duration	Delay		N		
TAVAN BOYASI 5.KISIM	ASAP	Duration	Delay	Must Start	N	19-Apr-93	
IC KAPILARIN YAPILMASI	ASAP	Duration	Delay	Must Start	N	30-Apr-93	
DIS SAC KAPILARIN YAPILMASI	FIXED	Duration	Delay	No Sooner	Y	1-Jun-93	7-Jul-93
AHSAP DOGRAMALARIN DEGISTIRILI	FIXED	Duration	Delay	No Sooner	Y	15-May-93	26-Jul-93
DIS CEPHE BOYASI	ASAP	Duration	Split	Must Start	N	5-May-93	
CATI TECRIDI TAMIRI	FIXED	Duration	Split	Must Start	Y	5-May-93	15-May-93
1600 LUK PRES TEMELI YAPIMI	FIXED	Duration	Delay	Must Start	Y	15-Apr-93	19-May-93
2200 LUK PRES TEMELININ YAPIMI	ASAP	Duration	Delay	Must Start	N	3-May-93	
FIRIN TEMELI	FIXED	Duration	Delay	Must Start	Y	1-May-93	24-May-93
MONTAJ ISLERI	SUMMARY				N		
1600 LUK PRES MONTAJI	ASAP	Duration	Delay		N		
2200 LUK PRES MONTAJI	ASAP	Duration	Delay		N		
ERITME FIRINI MONTAJI	ASAP	Duration	Delay		N		
MEVCUT TEZ.NAKLI	FIXED	Duration	Split	Must Start	Y	15-Feb-93	8-Apr-93
PANO MONTAJI	ASAP	Duration	Delay		N		
OTOMASYON MONTAJI	ALAP	Duration	Split		N		
MEKANIK ISLER	SUMMARY				N		

APPENDIX C

UPDATING

Task Name : The full name of the task.

Start Date : The entered (Fixed) or scheduled (ASAP, ALAP, Summary) start date of the task.

Duration in Days : The task duration (entered or calculated), expressed in days.

End Date : The entered (Fixed) or scheduled (ASAP, ALAP, Summary) end date of the task.

Percent Achieved : The amount of work accomplished, entered on detail tasks : rolled up by Baseline Dollars.

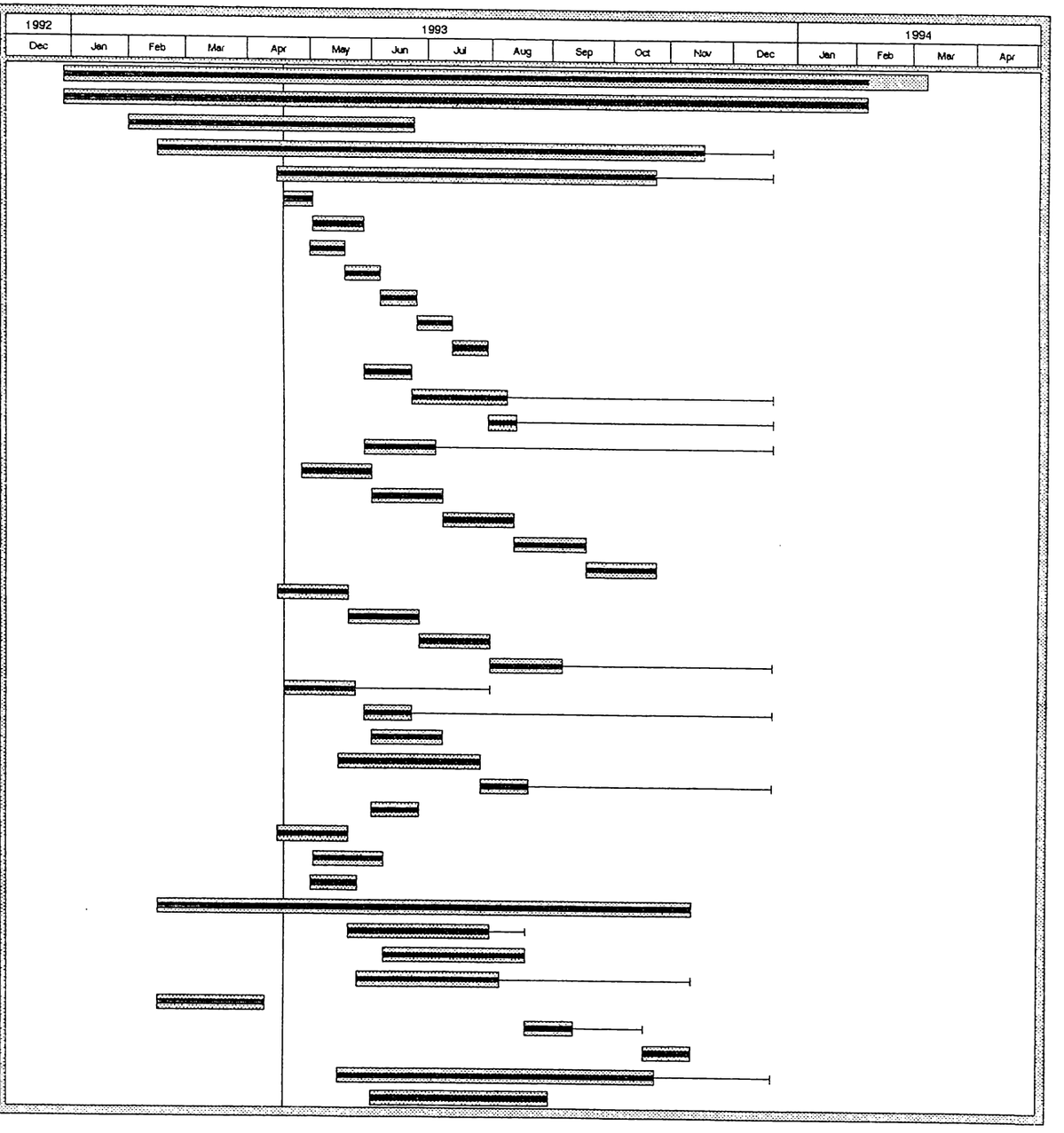
Start Date Variance : Difference (in days) between baseline start date and start date.... (Bsln StDt - StDt).

APPENDIX C

UPDATING

April 19, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
1.SAHA ISLERI	29-Dec	338	5-Feb	10	0
GENEL ISLER	29-Dec	338	5-Feb	25	0
MOBILIZASYON	1-Feb	120	23-Jun	40	0
ALUMINYUM EKZTRUZYON	15-Feb	230	16-Nov	1	0
INSAAT ISLERI	15-Apr	160	21-Oct	1	0
DUVARLARIN YIKILMASI	19-Apr	12	1-May	70	0
YENI DUVAR YAPIMI	3-May	22	27-May	0	0
DOSEME BETONU 1.BOLUM	1-May	15	18-May	0	0
DOSEME BETONU 2.BOLUM	19-May	15	7-Jun	0	0
DOSEME BETONU 3.BOLUM	8-Jun	15	24-Jun	0	0
DOSEME BETONU 4.BOLUM	25-Jun	15	12-Jul	0	0
DOSEME BETONU 5.BOLUM	13-Jul	15	29-Jul	0	0
SIVA ISLERI	28-May	20	22-Jun	0	0
IC DUVAR BOYALARI	23-Jun	40	7-Aug	0	0
KOLON SAC KAPLAMASI	30-Jul	12	12-Aug	0	0
DUVAR FAYANS KAPLAMASI	28-May	30	3-Jul	0	0
CELIK CATI BOYASI 1.KS	27-Apr	30	31-May	0	0
CELIK CATI BOYASI 2.KISIM	1-Jun	30	7-Jul	0	0
CELIK CATI BOYASI 3.KISIM	8-Jul	30	11-Aug	0	0
CELIK CATI BOYASI 4.KISIM	12-Aug	30	16-Sep	0	0
CELIK CATI BOYASI 5.KISIM	17-Sep	30	21-Oct	0	0
TAVAN BOYASI 1.KISIM	15-Apr	30	19-May	0	0
TAVAN BOYASI 2.KISIM	20-May	30	25-Jun	0	0
TAVAN BOYASI 3.KISIM	26-Jun	30	30-Jul	0	0
TAVAN BOYASI 4.KISIM	31-Jul	30	4-Sep	0	0
TAVAN BOYASI 5.KISIM	19-Apr	30	22-May	10	0
IC KAPILARIN YAPILMASI	28-May	20	22-Jun	0	0
DIS SAC KAPILARIN YAPILMASI	1-Jun	30	7-Jul	0	0
AHSAP DOGRAMALARIN DEGISTIRILI	15-May	60	26-Jul	0	0
DIS CEPHE BOYASI	27-Jul	20	18-Aug	0	0
CATI TECRIDI TAMIRI	1-Jun	20	25-Jun	0	0
1600 LUK PRES TEMELI YAPIMI	15-Apr	30	19-May	20	0
2200 LUK PRES TEMELININ YAPIMI	3-May	30	8-Jun	0	0
FIRIN TEMELI	1-May	20	24-May	0	0
MONTAJ ISLERI	15-Feb	225	10-Nov	8	0
1600 LUK PRES MONTAJI	20-May	60	30-Jul	0	0
2200 LUK PRES MONTAJI	9-Jun	60	17-Aug	0	0
ERITME FIRINI MONTAJI	25-May	60	4-Aug	0	0
MEVCUT TEZ NAKLI	15-Feb	45	8-Apr	100	0
PANO MONTAJI	18-Aug	20	10-Sep	0	0
OTOMASYON MONTAJI	16-Oct	20	10-Nov	0	0
MEKANIK ISLER	15-May	134	21-Oct	0	0
ISITMA SISTEMI	1-Jun	75	28-Aug	0	0



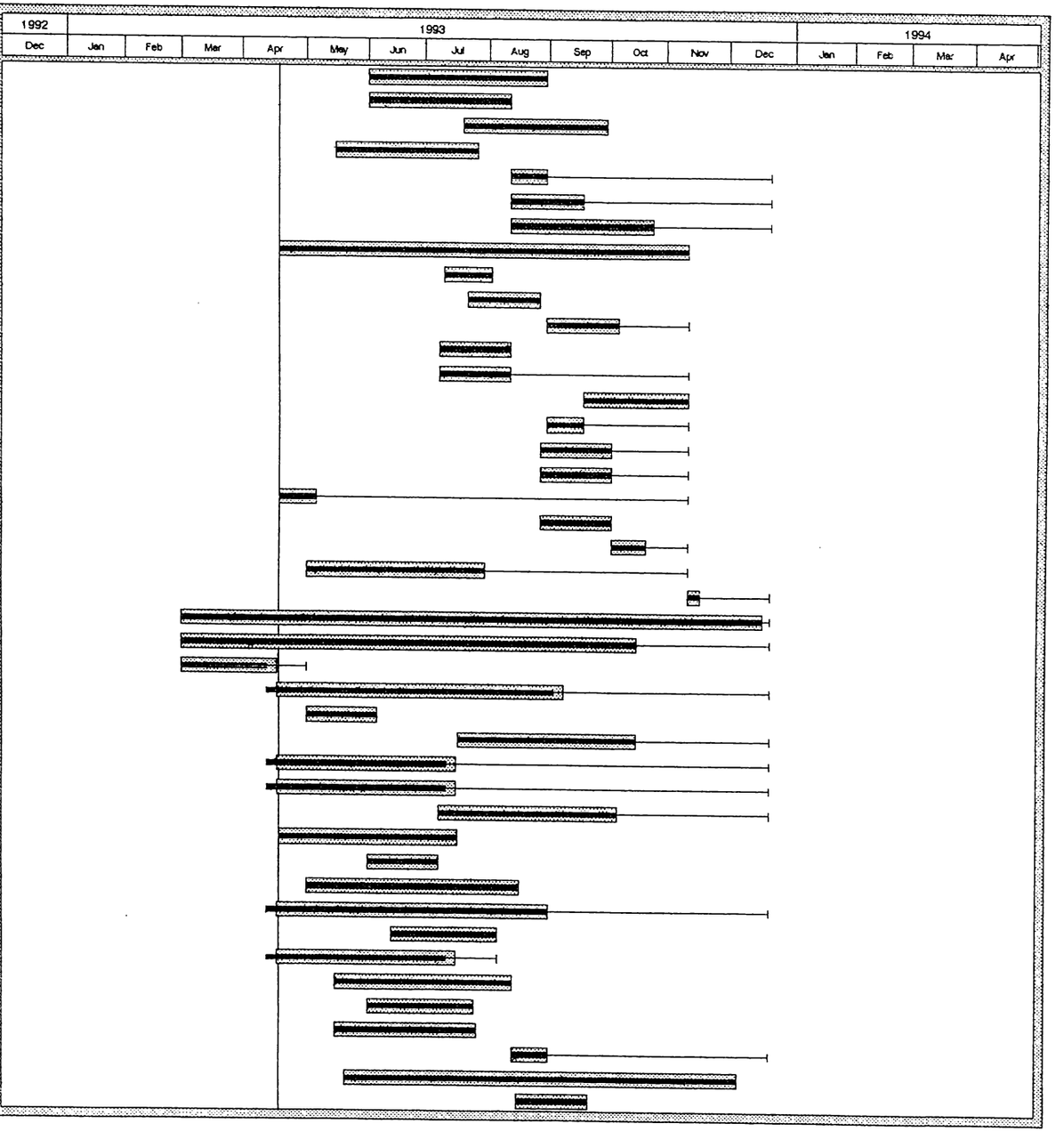
Baseline Actual Milestone Slack

APPENDIX C

UPDATING

April 18, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
HAVALANDIRMA SISTEMI	1-Jun	75	28-Aug	0	0
SICAK VE SOGUK SU BORULARI	1-Jun	60	11-Aug	0	0
KANALIZASYON SISTEMI	20-Jul	60	28-Sep	0	0
SIHHI TESISAT	15-May	60	26-Jul	0	0
YANGIN KORUMA	12-Aug	15	28-Aug	0	0
BASINCLI HAVA BORULARI	12-Aug	30	16-Sep	0	0
GAZ BORULARI	12-Aug	60	21-Oct	0	0
ELEKTRIK ISLERI	19-Apr	172	10-Nov	0	0
ANA PANOLAR	10-Jul	20	2-Aug	0	0
YARDIMCI PANOLAR	22-Jul	30	25-Aug	0	0
TALI MEK. SISTEM OTOMAZISYONU	31-Aug	30	4-Oct	0	0
ALCAK GERILIM KABLOLARI	8-Jul	30	11-Aug	0	0
KABLO SAIR ISLERI	8-Jul	30	11-Aug	0	0
AYDINLATMA TESISATI	17-Sep	45	10-Nov	0	0
MOTOR SALTERLERI	31-Aug	15	16-Sep	0	0
YANGIN SINYALIZASYON	26-Aug	30	30-Sep	0	0
YANGIN IHBAR	26-Aug	30	30-Sep	0	0
TELEFON SISTEMI	19-Apr	15	5-May	0	0
SAAT SISTEMI	26-Aug	30	30-Sep	0	0
RADYO-SES DUZENI	1-Oct	15	18-Oct	0	0
TOPRAKLAMA VE PARATONER	1-May	75	29-Jul	0	0
ALUMINYUM BITISI	11-Nov	5	16-Nov	0	0
IDARE BINASI	1-Mar	244	16-Dec	1	0
INSAAT ISLERI	1-Mar	191	13-Oct	1	0
DUVAR YIKILMASI	1-Mar	36	12-Apr	100	0
DUVAR BOYASI	13-Apr	120	2-Sep	0	4
ALUASMA TAVANLAR	1-May	30	7-Jun	0	0
MARLEY KAPLAMA	17-Jul	75	13-Oct	0	0
SERAMIK KAPLAMALAR	13-Apr	75	10-Jul	0	4
FAYANS ISLERI	13-Apr	75	10-Jul	0	4
DIS CEPHE KAPLAMASI	8-Jul	75	4-Oct	0	0
AHSAP KAPILAR	19-Apr	75	16-Jul	0	0
DIS ALU.KAPILAR	1-Jun	30	7-Jul	0	0
PENCERELERIN DEGISTIRILMESI	1-May	90	16-Aug	0	0
MEKANIK ISLER	13-Apr	118	31-Aug	0	4
ISITMA SISTEMI	15-Jun	45	5-Aug	0	0
VANTILASYON SISTEMI	13-Apr	75	10-Jul	0	4
SU BORULARI	15-May	75	12-Aug	0	0
KANALIZASYON	1-Jun	45	24-Jul	0	0
SIHHI TESISAT	15-May	60	26-Jul	0	0
YANGIN DOLAPLARI	13-Aug	15	31-Aug	0	0
ELEKTRIK ISLERI	20-May	166	4-Dec	0	0
ANA PANOLAR	16-Aug	30	20-Sep	0	0



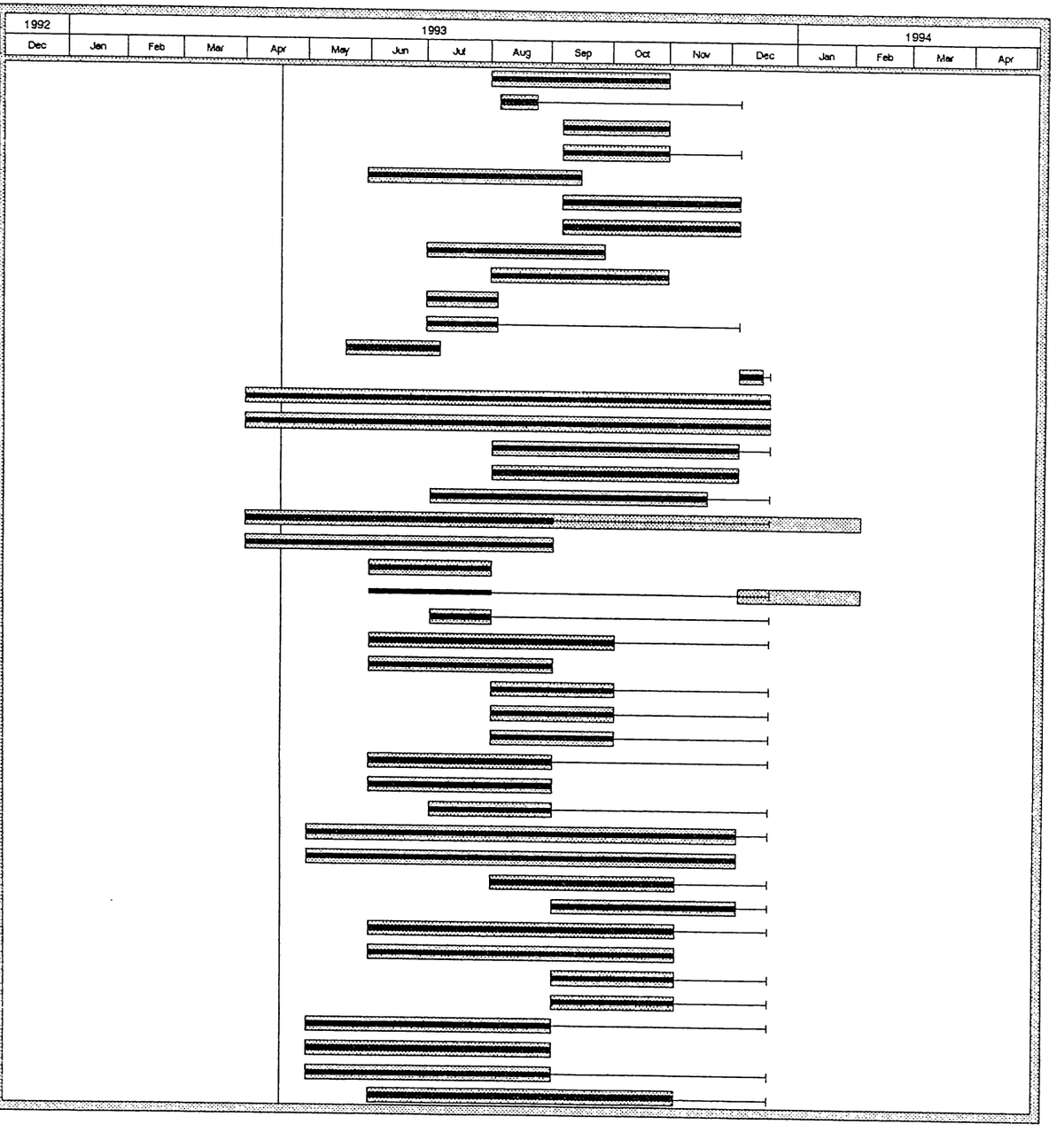
Baseline Actual Milestone Slack

APPENDIX C

UPDATING

April 19, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
TALI PANOLAR	2-Aug	75	28-Oct	0	0
YAR.MEK.SITEM OTOMAZISYONU	6-Aug	15	23-Aug	0	0
KABLOLAR	7-Sep	45	28-Oct	0	0
KABLO TEFERRUATI	7-Sep	45	28-Oct	0	0
AYDINLATMA SISTEMI	31-May	90	15-Sep	0	0
YANGIN SINYALIZASYONU	7-Sep	75	4-Dec	0	0
YANGIN IHBAR	7-Sep	75	4-Dec	0	0
TELEFON SISTEMI	1-Jul	75	27-Sep	0	0
GUVENLIK SINYALIZASYONU	2-Aug	75	28-Oct	0	0
SAAT SISTEMI	1-Jul	30	4-Aug	0	0
RADYO SISTEMI	1-Jul	30	4-Aug	0	0
TOPR. VE PARATONER SISTEMI	20-May	40	7-Jul	0	0
IDARE BIN.BITISI	6-Dec	10	16-Dec	0	0
KAZAN DAIRESI	1-Apr	221	20-Dec	0	0
INSAAT ISLERI	1-Apr	221	20-Dec	0	0
ELEKTRIK ISLERI	3-Aug	104	4-Dec	0	0
MEKANIK ISLER	3-Aug	104	4-Dec	0	0
MONTAJ ISLERI	3-Jul	117	19-Nov	0	0
KOMPRESOR BINASI	1-Apr	130	2-Sep	0	0
INSAAT ISLERI	1-Apr	130	2-Sep	0	0
MEKANIK ISLER	1-Jun	52	2-Aug	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	156
MONTAJ ISLERI	3-Jul	26	2-Aug	0	0
POMPA ISTASYONU	1-Jun	104	2-Oct	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
MEKANIK ISLER	3-Aug	52	2-Oct	0	0
ELEKTRIK ISLERI	3-Aug	52	2-Oct	0	0
MONTAJ ISLERI	3-Aug	52	2-Oct	0	0
GIRIS KAPISI	1-Jun	78	2-Sep	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
ELEKTRIK ISLERI	3-Jul	52	2-Sep	0	0
KANAL.POMPA IST	1-May	182	4-Dec	0	0
INSAAT ISLERI	1-May	182	4-Dec	0	0
ELEKTRIK ISLERI	3-Aug	78	4-Nov	0	0
MONTAJ ISLERI	3-Sep	78	4-Dec	0	0
YAGMUR SUYU TANKI	1-Jun	130	4-Nov	0	0
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
ELEKTRIK ISLERI	3-Sep	52	4-Nov	0	0
MONTAJ ISLERI	3-Sep	52	4-Nov	0	0
SAHA KANALIZASYON	1-May	104	2-Sep	0	0
INSAAT ISLERI	1-May	104	2-Sep	0	0
MEKANIK ISLER	1-May	104	2-Sep	0	0
SICAK SU SEBEKES	1-Jun	130	4-Nov	0	0



Baseline Actual Milestone Slack

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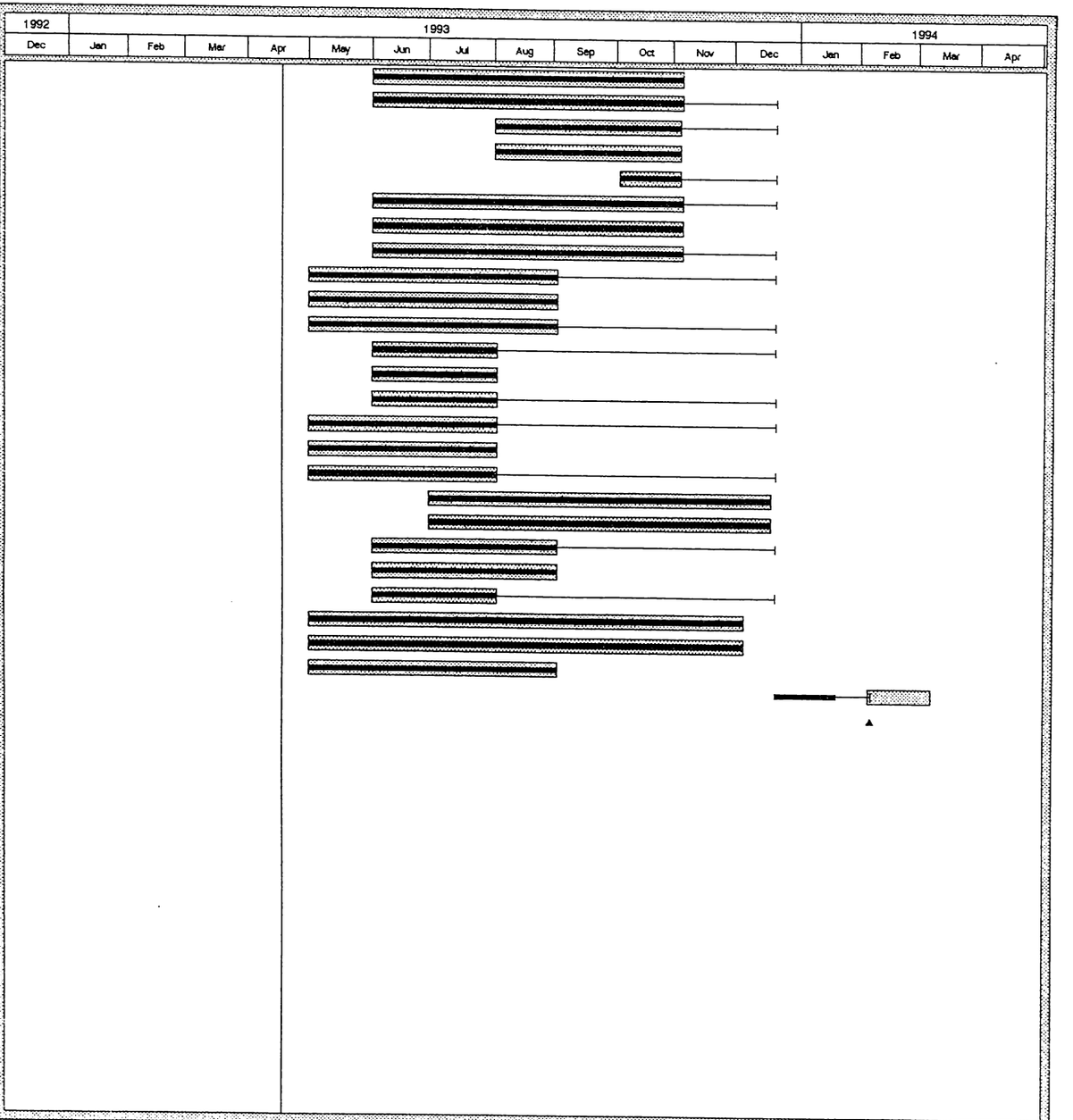
UPDATING

April 19, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
MEKANIK ISLER	1-Jun	130	4-Nov	0	0
YAGM.SU ARITMA	2-Aug	78	3-Nov	0	0
INSAAT ISLERI	2-Aug	78	3-Nov	0	0
MONTAJ ISLERI	2-Oct	26	3-Nov	0	0
SAH.YAG.SUYU TOPLAMA	1-Jun	130	4-Nov	0	0
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
MEKANIK ISLER	1-Jun	130	4-Nov	0	0
GAZ VE BA.HAVA SEBEKESI	1-May	104	2-Sep	0	0
INSAAT ISLERI	1-May	104	2-Sep	0	0
MEKANIK ISLER	1-May	104	2-Sep	0	0
SAHA 1 KV ELEKTRIKI	1-Jun	52	2-Aug	0	0
INSAAT ISLERI	1-Jun	52	2-Aug	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	0
SAHA 10 KV DAGITIM	1-May	78	2-Aug	0	0
INSAAT ISLERI	1-May	78	2-Aug	0	0
ELEKTRIK ISLERI	1-May	78	2-Aug	0	0
SAHA YOLLARI	1-Jul	143	17-Dec	0	0
INSAAT ISLERI	1-Jul	143	17-Dec	0	0
CEVRE DUVARI	1-Jun	78	2-Sep	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	0
SAHA DISI ISLER	1-May	182	4-Dec	0	0
DIS YOLLAR	1-May	182	4-Dec	0	0
10 KV.KABLO DOSENMESI	1-May	104	2-Sep	0	0
GECICI KABUL	21-Dec	26	20-Jan	0	39
ISIN BITISI	7-Feb	0	7-Feb	0	



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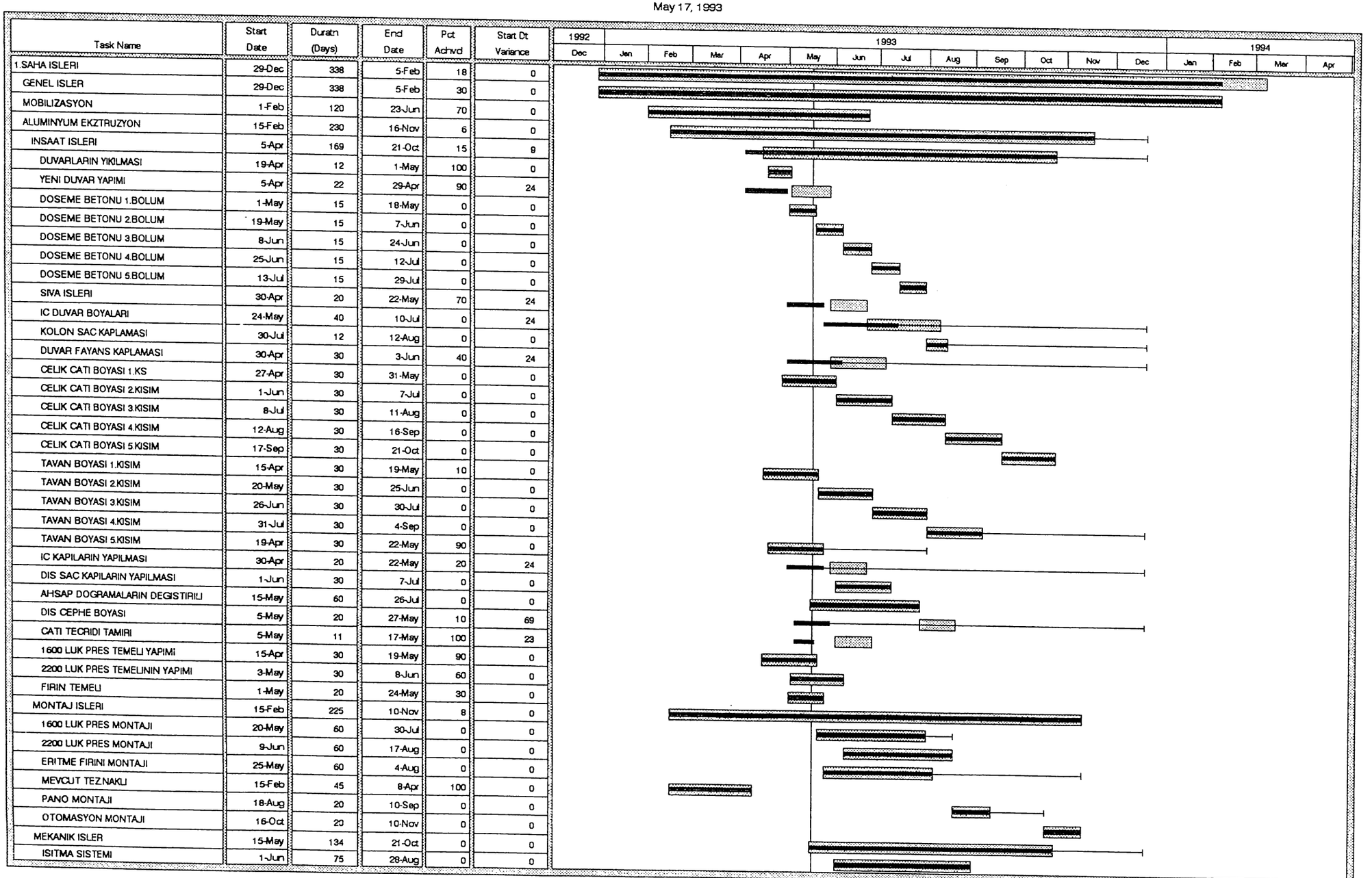
May 17, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
1.SAHA ISLERI	29-Dec	338	5-Feb	18	0
GENEL ISLER	29-Dec	338	5-Feb	30	0
MOBILIZASYON	1-Feb	120	23-Jun	70	0
ALUMINYUM EKZTRUZYON	15-Feb	230	16-Nov	6	0
INSAAT ISLERI	5-Apr	169	21-Oct	15	8
DUVARLARIN YIKILMASI	19-Apr	12	1-May	100	0
YENI DUVAR YAPIMI	5-Apr	22	29-Apr	90	24
DOSEME BETONU 1.BOLUM	1-May	15	18-May	0	0
DOSEME BETONU 2.BOLUM	19-May	15	7-Jun	0	0
DOSEME BETONU 3.BOLUM	8-Jun	15	24-Jun	0	0
DOSEME BETONU 4.BOLUM	25-Jun	15	12-Jul	0	0
DOSEME BETONU 5.BOLUM	13-Jul	15	29-Jul	0	0
SIVA ISLERI	30-Apr	20	22-May	70	24
IC DUVAR BOYALARI	24-May	40	10-Jul	0	24
KOLON SAC KAPLAMASI	30-Jul	12	12-Aug	0	0
DUVAR FAYANS KAPLAMASI	30-Apr	30	3-Jun	40	24
CELIK CATI BOYASI 1.KS	27-Apr	30	31-May	0	0
CELIK CATI BOYASI 2.KISIM	1-Jun	30	7-Jul	0	0
CELIK CATI BOYASI 3.KISIM	8-Jul	30	11-Aug	0	0
CELIK CATI BOYASI 4.KISIM	12-Aug	30	16-Sep	0	0
CELIK CATI BOYASI 5.KISIM	17-Sep	30	21-Oct	0	0
TAVAN BOYASI 1.KISIM	15-Apr	30	19-May	10	0
TAVAN BOYASI 2.KISIM	20-May	30	25-Jun	0	0
TAVAN BOYASI 3.KISIM	26-Jun	30	30-Jul	0	0
TAVAN BOYASI 4.KISIM	31-Jul	30	4-Sep	0	0
TAVAN BOYASI 5.KISIM	19-Apr	30	22-May	90	0
IC KAPILARIN YAPILMASI	30-Apr	20	22-May	20	24
DIS SAC KAPILARIN YAPILMASI	1-Jun	30	7-Jul	0	0
AHSAP DOGRAMALARIN DEGISTIRILI	15-May	60	26-Jul	0	0
DIS CEPHE BOYASI	5-May	20	27-May	10	69
CATI TECRIDI TAMIRI	5-May	11	17-May	100	23
1600 LUK PRES TEMELI YAPIMI	15-Apr	30	19-May	90	0
2200 LUK PRES TEMELININ YAPIMI	3-May	30	8-Jun	60	0
FIRIN TEMELI	1-May	20	24-May	30	0
MONTAJ ISLERI	15-Feb	225	10-Nov	8	0
1600 LUK PRES MONTAJI	20-May	60	30-Jul	0	0
2200 LUK PRES MONTAJI	9-Jun	60	17-Aug	0	0
ERITME FIRINI MONTAJI	25-May	60	4-Aug	0	0
MEVCUT TEZ.NAKLI	15-Feb	45	8-Apr	100	0
PANO MONTAJI	18-Aug	20	10-Sep	0	0
OTOMASYON MONTAJI	16-Oct	20	10-Nov	0	0
MEKANIK ISLER	15-May	134	21-Oct	0	0
ISITMA SISTEMI	1-Jun	75	28-Aug	0	0



Baseline

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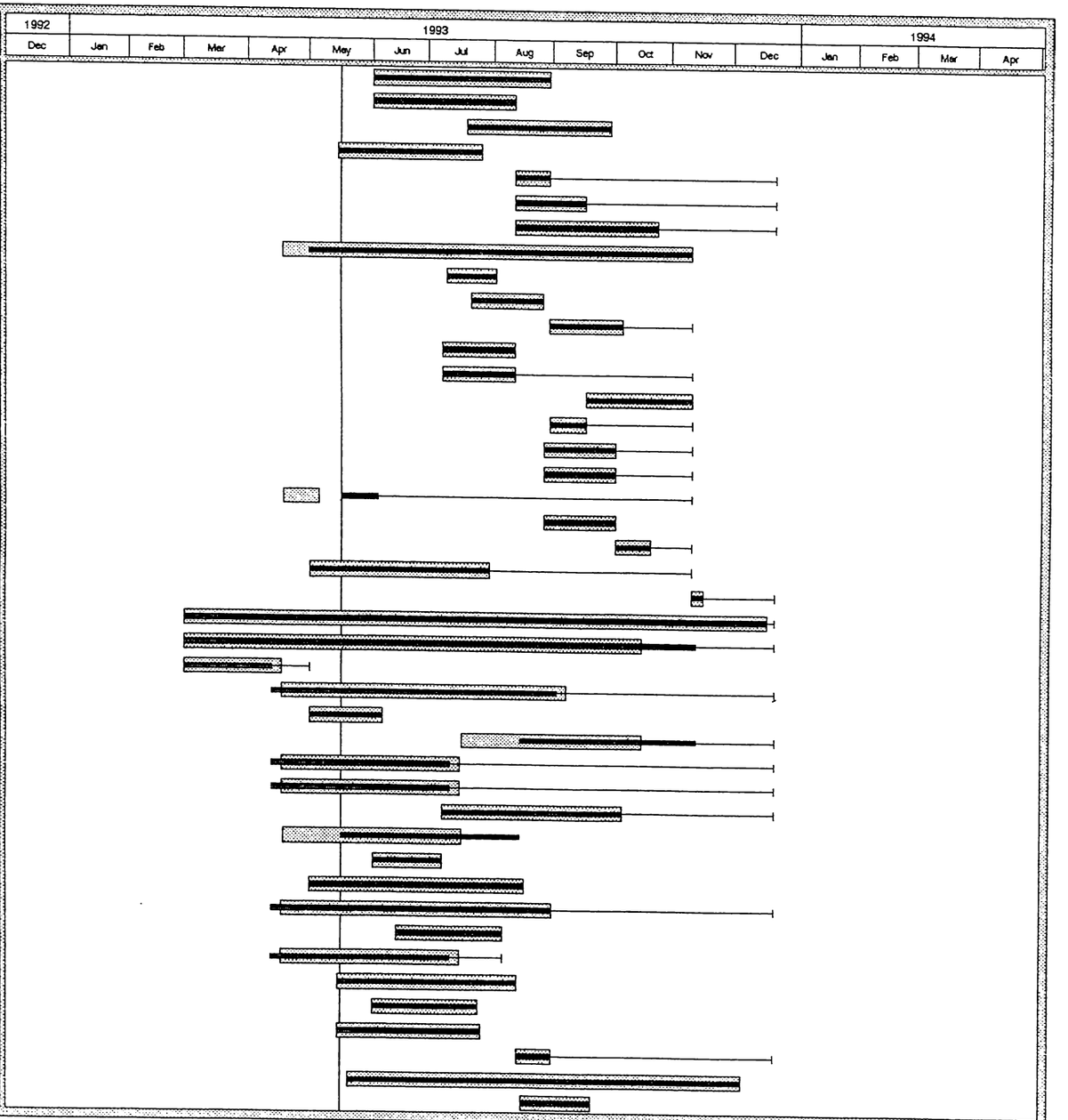
APPENDIX C

UPDATING

May 17, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
HAVALANDIRMA SISTEMI	1-Jun	75	28-Aug	0	0
SICAK VE SOGUK SU BORULARI	1-Jun	60	11-Aug	0	0
KANALIZASYON SISTEMI	20-Jul	60	28-Sep	0	0
SIHHI TESISAT	15-May	60	26-Jul	0	0
YANGIN KORUMA	12-Aug	15	28-Aug	0	0
BASINCLI HAVA BORULARI	12-Aug	30	16-Sep	0	0
GAZ BORULARI	12-Aug	60	21-Oct	0	0
ELEKTRIK ISLERI	1-May	161	10-Nov	0	-11
ANA PANOLAR	10-Jul	20	2-Aug	0	0
YARDIMCI PANOLAR	22-Jul	30	25-Aug	0	0
TALI MEK. SISTEM OTOMAZISYONU	31-Aug	30	4-Oct	0	0
ALCAK GERILIM KABLOLARI	8-Jul	30	11-Aug	0	0
KABLO SAIR ISLERI	8-Jul	30	11-Aug	0	0
AYDINLATMA TESISATI	17-Sep	45	10-Nov	0	0
MOTOR SALTERLERI	31-Aug	15	16-Sep	0	0
YANGIN SINYALIZASYON	26-Aug	30	30-Sep	0	0
YANGIN IHBAR	26-Aug	30	30-Sep	0	0
TELEFON SISTEMI	17-May	15	2-Jun	0	-24
SAAT SISTEMI	26-Aug	30	30-Sep	0	0
RADYO-SES DUZENI	1-Oct	15	18-Oct	0	0
TOPRAKLAMA VE PARATONER	1-May	75	29-Jul	0	0
ALUMINYUM BITISI	11-Nov	5	16-Nov	0	0
IDARE BINASI	1-Mar	244	16-Dec	6	0
INSAAT ISLERI	1-Mar	215	12-Nov	8	0
DUVAR YIKILMASI	1-Mar	36	12-Apr	100	0
DUVAR BOYASI	13-Apr	120	2-Sep	50	4
ALUASMA TAVANLAR	1-May	30	7-Jun	40	0
MARLEY KAPLAMA	14-Aug	75	12-Nov	0	-24
SERAMIK KAPLAMALAR	13-Apr	75	10-Jul	30	4
FAYANS ISLERI	13-Apr	75	10-Jul	50	4
DIS CEPHE KAPLAMASI	8-Jul	75	4-Oct	0	0
AHSAP KAPILAR	17-May	75	13-Aug	10	-24
DIS ALU.KAPILAR	1-Jun	30	7-Jul	0	0
PENCERELERIN DEGISTIRILMESI	1-May	90	16-Aug	0	0
MEKANIK ISLER	13-Apr	118	31-Aug	8	4
ISITMA SISTEMI	15-Jun	45	5-Aug	0	0
VANTILASYON SISTEMI	13-Apr	75	10-Jul	20	4
SU BORULARI	15-May	75	12-Aug	5	0
KANALIZASYON	1-Jun	45	24-Jul	0	0
SIHHI TESISAT	15-May	60	26-Jul	10	0
YANGIN DOLAPLARI	13-Aug	15	31-Aug	0	0
ELEKTRIK ISLERI	20-May	166	4-Dec	0	0
ANA PANOLAR	16-Aug	30	20-Sep	0	0



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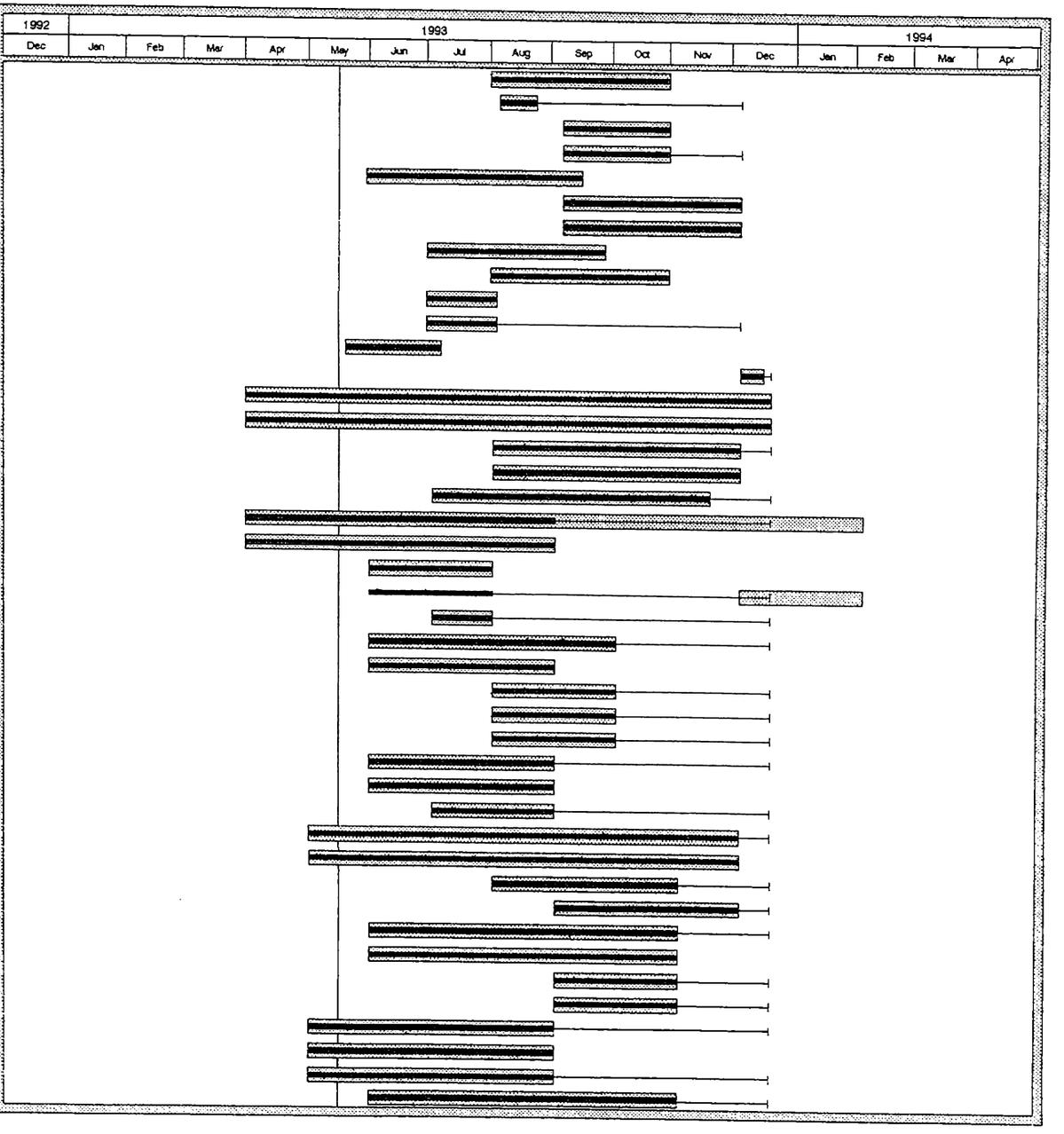
APPENDIX C

UPDATING

May 17, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
TALI PANOLAR	2-Aug	75	28-Oct	0	0
YAR.MEK.SITEM OTOMAZISYONU	6-Aug	15	23-Aug	0	0
KABLOLAR	7-Sep	45	28-Oct	0	0
KABLO TEFERRUATI	7-Sep	45	28-Oct	0	0
AYDINLATMA SISTEMI	31-May	90	15-Sep	0	0
YANGIN SINYALIZASYONU	7-Sep	75	4-Dec	0	0
YANGIN IHBAR	7-Sep	75	4-Dec	0	0
TELEFON SISTEMI	1-Jul	75	27-Sep	0	0
GUVENLIK SINYALIZASYONU	2-Aug	75	28-Oct	0	0
SAAT SISTEMI	1-Jul	30	4-Aug	0	0
RADYO SISTEMI	1-Jul	30	4-Aug	0	0
TOPR. VE PARATONER SISTEMI	20-May	40	7-Jul	0	0
IDARE BIN.BITISI	6-Dec	10	16-Dec	0	0
KAZAN DAIRESI	1-Apr	221	20-Dec	0	0
INSAAT ISLERI	1-Apr	221	20-Dec	0	0
ELEKTRIK ISLERI	3-Aug	104	4-Dec	0	0
MEKANIK ISLER	3-Aug	104	4-Dec	0	0
MONTAJ ISLERI	3-Jul	117	19-Nov	0	0
KOMPRESOR BINASI	1-Apr	130	2-Sep	12	0
INSAAT ISLERI	1-Apr	130	2-Sep	20	0
MEKANIK ISLER	1-Jun	52	2-Aug	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	156
MONTAJ ISLERI	3-Jul	26	2-Aug	0	0
POMPA ISTASYONU	1-Jun	104	2-Oct	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
MEKANIK ISLER	3-Aug	52	2-Oct	0	0
ELEKTRIK ISLERI	3-Aug	52	2-Oct	0	0
MONTAJ ISLERI	3-Aug	52	2-Oct	0	0
GIRIS KAPISI	1-Jun	78	2-Sep	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
ELEKTRIK ISLERI	3-Jul	52	2-Sep	0	0
KANAL.POMPA IST	1-May	182	4-Dec	0	0
INSAAT ISLERI	1-May	182	4-Dec	0	0
ELEKTRIK ISLERI	3-Aug	78	4-Nov	0	0
MONTAJ ISLERI	3-Sep	78	4-Dec	0	0
YAGMUR SUYU TANKI	1-Jun	130	4-Nov	0	0
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
ELEKTRIK ISLERI	3-Sep	52	4-Nov	0	0
MONTAJ ISLERI	3-Sep	52	4-Nov	0	0
SAHA KANALIZASYON	1-May	104	2-Sep	0	0
INSAAT ISLERI	1-May	104	2-Sep	0	0
MEKANIK ISLER	1-May	104	2-Sep	0	0
SICAK SU SEBEKES	1-Jun	130	4-Nov	0	0



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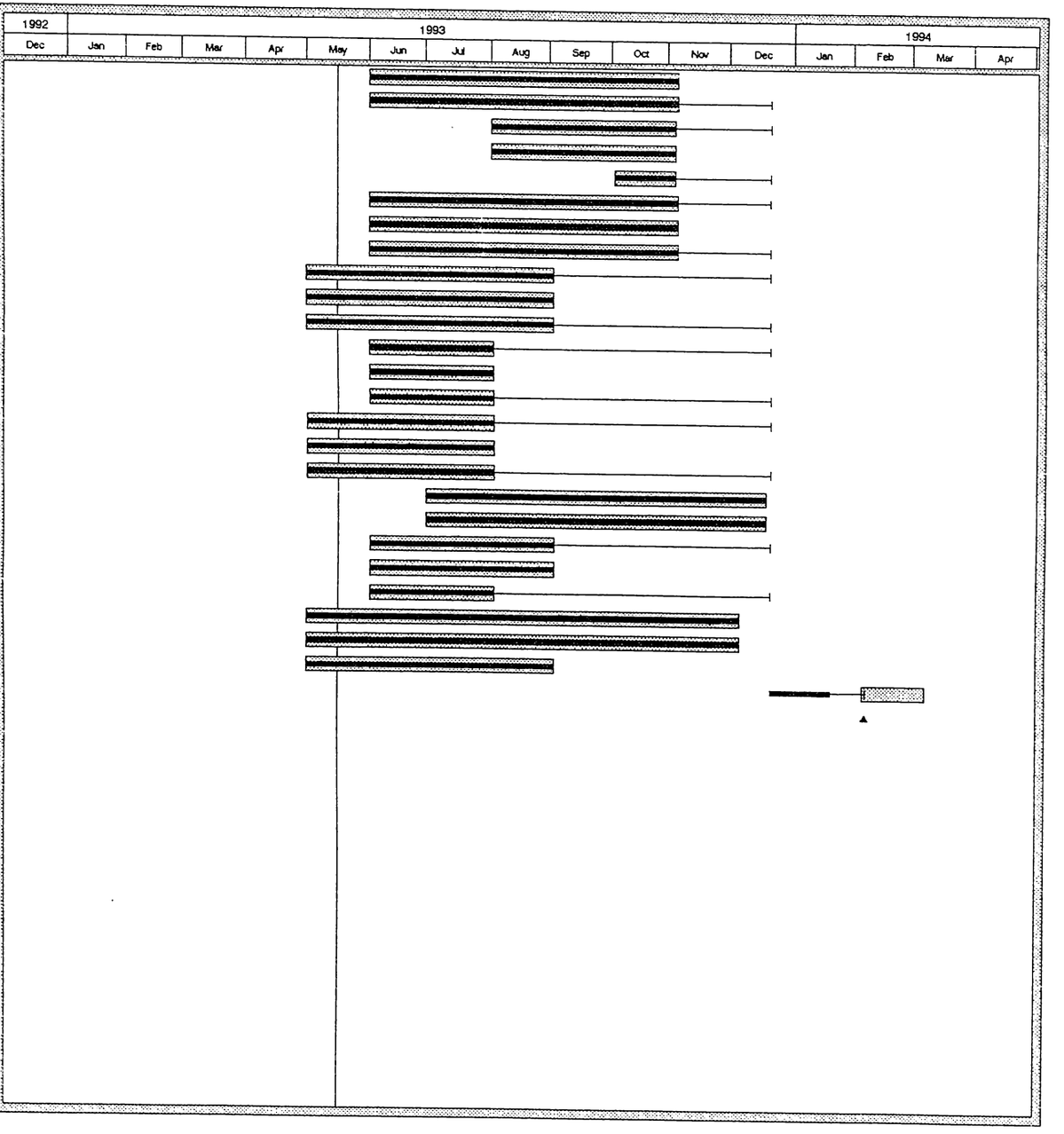
UPDATING

May 17, 1993

Task Name	Start Date	Duratn (Days)	End Date	Pct Achvd	Start Dt Variance
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
MEKANIK ISLER	1-Jun	130	4-Nov	0	0
YAGM.SU ARITMA	2-Aug	78	3-Nov	0	0
INSAAT ISLERI	2-Aug	78	3-Nov	0	0
MONTAJ ISLERI	2-Oct	26	3-Nov	0	0
SAH.YAG.SUYU TOPLAMA	1-Jun	130	4-Nov	0	0
INSAAT ISLERI	1-Jun	130	4-Nov	0	0
MEKANIK ISLER	1-Jun	130	4-Nov	0	0
GAZ VE BA.HAVA SEBEKESI	1-May	104	2-Sep	0	0
INSAAT ISLERI	1-May	104	2-Sep	0	0
MEKANIK ISLER	1-May	104	2-Sep	0	0
SAHA 1 KV ELEKTRIKI	1-Jun	52	2-Aug	0	0
INSAAT ISLERI	1-Jun	52	2-Aug	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	0
SAHA 10 KV DAGITIM	1-May	78	2-Aug	0	0
INSAAT ISLERI	1-May	78	2-Aug	0	0
ELEKTRIK ISLERI	1-May	78	2-Aug	0	0
SAHA YOLLARI	1-Jul	143	17-Dec	0	0
INSAAT ISLERI	1-Jul	143	17-Dec	0	0
CEVRE DUVARI	1-Jun	78	2-Sep	0	0
INSAAT ISLERI	1-Jun	78	2-Sep	0	0
ELEKTRIK ISLERI	1-Jun	52	2-Aug	0	0
SAHA DISI ISLER	1-May	182	4-Dec	0	0
DIS YOLLAR	1-May	182	4-Dec	0	0
10 KV.KABLO DOSENMESI	1-May	104	2-Sep	0	0
GECICI KABUL	21-Dec	26	20-Jan	0	39
ISIN BITISI	7-Feb	0	7-Feb	0	



Baseline | Actual | Milestone | Slack

APPENDIX D

DETAILED S-CURVE DATA

APPENDIX D

Detailed S-curve Data

WEEK	#	Estimated BCWS	% BCWS	Achieved BCWP	% BCWP	Actual Cost
12/29	0	0.00	0.00%			
01/04	1	7,100.59	0.07%			
01/11	2	21,301.78	0.21%			
01/18	3	35,502.96	0.35%			
01/25	4	49,704.14	0.49%			
02/01	5	63,905.33	0.63%			
02/08	6	178,106.51	1.75%			
02/15	7	292,307.69	2.87%			
02/22	8	407,227.54	4.00%			
03/01	9	522,147.39	5.13%			
03/08	10	637,883.24	6.27%			
03/15	11	753,619.09	7.40%			
03/22	12	869,354.94	8.54%			
03/29	13	965,801.48	9.49%			850,000.00
04/05	14	1,088,392.54	10.69%			
04/12	15	1,217,599.24	11.96%			
04/19	16	1,352,053.56	13.28%	1,020,398.40	10.03%	
04/26	17	1,506,881.55	14.81%			
05/03	18	1,688,104.42	16.59%			1,980,000.00
05/10	19	1,986,225.50	19.51%			
05/17	20	2,291,259.92	22.51%	1,873,077.80	18.40%	
05/24	21	2,633,019.00	25.87%			
05/31	22	2,967,838.64	29.16%			3,340,000.00
06/07	23	3,273,305.00	32.16%			
06/14	24	3,760,720.08	36.95%			
06/21	25	4,245,243.83	41.71%			
06/28	26	4,676,747.58	45.95%			
07/05	27	5,060,737.88	49.72%			
07/12	28	5,474,412.33	53.79%			
07/19	29	5,902,132.91	57.99%			
07/26	30	6,331,712.56	62.21%			
08/02	31	6,720,438.21	66.03%			
08/09	32	7,056,448.21	69.33%			
08/16	33	7,403,295.63	72.74%			
08/23	34	7,751,034.14	76.15%			
08/31	35	8,090,605.53	79.49%			
09/06	36	8,262,939.79	81.18%			
09/13	37	8,449,526.60	83.02%			
09/20	38	8,633,651.41	84.83%			
09/27	39	8,811,711.78	86.58%			
10/04	40	8,986,648.04	88.29%			
10/11	41	9,153,966.36	89.94%			
10/18	42	9,316,727.87	91.54%			
10/25	43	9,469,960.59	93.04%			
11/01	44	9,565,286.40	93.98%			
11/08	45	9,677,945.37	95.09%			
11/15	46	9,762,607.01	95.92%			
11/22	47	9,839,655.93	96.68%			
11/29	48	9,910,294.59	97.37%			
12/06	49	9,980,933.25	98.06%			
12/13	50	10,020,068.62	98.45%			
12/20	51	10,056,756.44	98.81%			
12/27	52	10,075,550.38	98.99%			
01/03/94	53	10,090,269.31	99.14%			
01/10/94	54	10,107,932.04	99.31%			
01/17/94	55	10,125,594.76	99.49%			
01/24/94	56	10,143,257.48	99.66%			
01/31/94	57	10,160,920.20	99.83%			
02/07/94	58	10,178,006.00	100.00%			
02/14/94	59	10,178,006.00	100.00%			

APPENDIX E

CPM Calculations

Task Name : The full name of the task.

Start Date : The entered (Fixed) or scheduled (ASAP, ALAP, Summary) start date of the task.

Duration in Days : The task duration (entered or calculated), expressed in days.

End Date : The entered (Fixed) or scheduled (ASAP, ALAP, Summary) end date of the task.

Slack Days, Free : Time (in days) the task could slip without affecting another task.

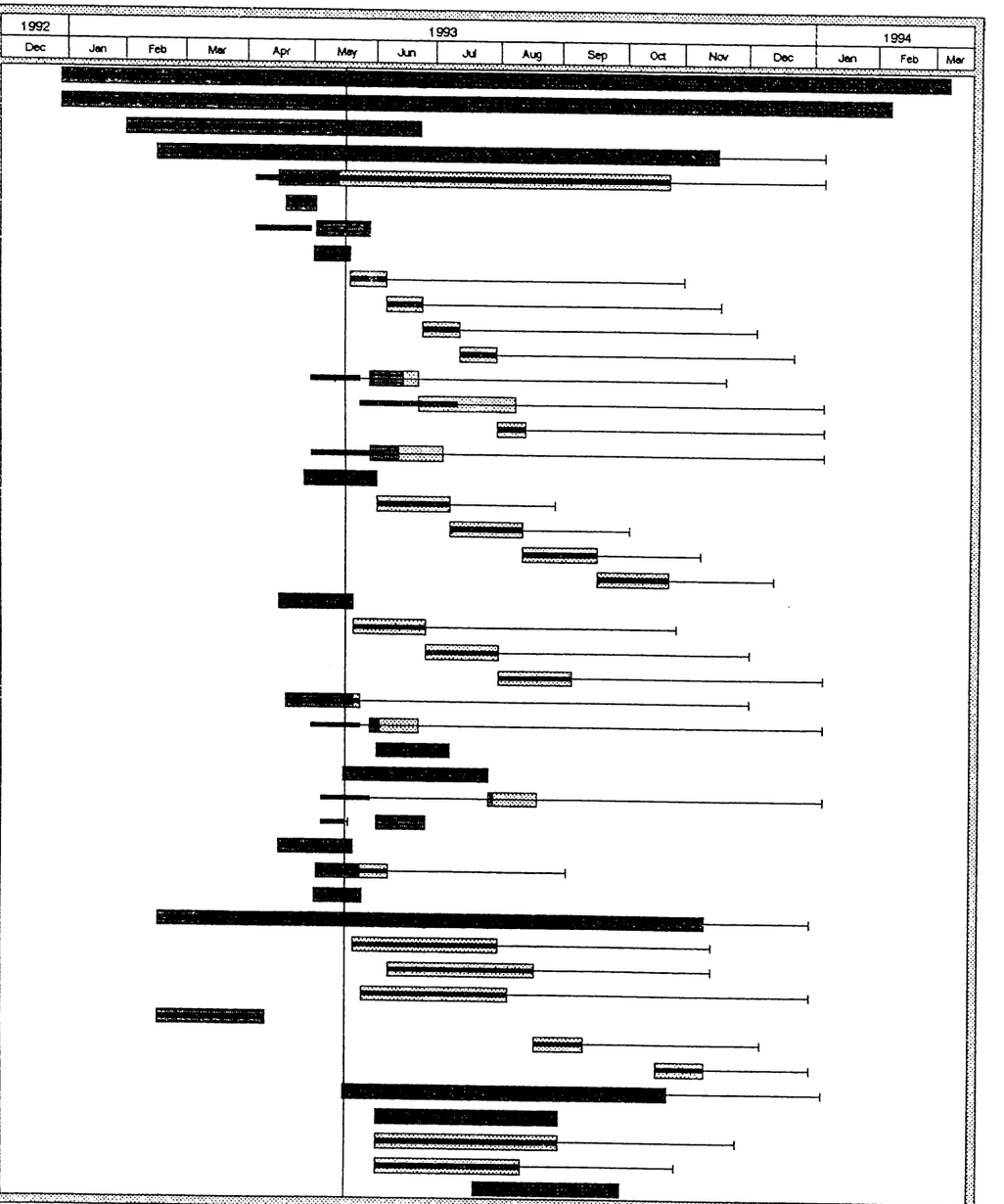
Slack Days, Total : Time (in days) the task could slip without affecting another fixed task.

Slack Days, Independent : The amount of slack (in days), if the task begins at the Start Date, Late Ind.

APPENDIX E

CPM CALCULATIONS

Task Name	Start Date	Duratn (Days)	End Date	FrSlack (Days)	TISlack (Days)	Ind Slac (Days)
1.SAHA ISLERI	29-Dec-92	338	5-Feb-94	0	0	0
GENEL ISLER	29-Dec-92	338	5-Feb-94	0	0	0
MOBILIZASYON	1-Feb-93	120	23-Jun-93	0	0	0
ALUMINYUM EKZTRUZYON	15-Feb-93	230	16-Nov-93	29	43	29
INSAAT ISLERI	5-Apr-93	169	21-Oct-93	49	63	49
DUVARLARIN YIKILMASI	19-Apr-93	12	1-May-93	0	0	0
YENI DUVAR YAPIMI	5-Apr-93	22	29-Apr-93	0	0	0
DOSEME BETONU 1.BOLUM	1-May-93	15	18-May-93	0	0	0
DOSEME BETONU 2.BOLUM	19-May-93	15	7-Jun-93	0	122	0
DOSEME BETONU 3.BOLUM	8-Jun-93	15	24-Jun-93	0	122	-122
DOSEME BETONU 4.BOLUM	25-Jun-93	15	12-Jul-93	0	122	-122
DOSEME BETONU 5.BOLUM	13-Jul-93	15	29-Jul-93	0	122	-122
SIVA ISLERI	30-Apr-93	20	22-May-93	0	150	0
IC DUVAR BOYALARI	24-May-93	40	10-Jul-93	136	150	-14
KOLON SAC KAPLAMASI	30-Jul-93	12	12-Aug-93	108	122	-14
DUVAR FAYANS KAPLAMASI	30-Apr-93	30	3-Jun-93	166	180	166
CELIK CATI BOYASI 1.KS	27-Apr-93	30	31-May-93	0	0	0
CELIK CATI BOYASI 2.KISIM	1-Jun-93	30	7-Jul-93	0	43	0
CELIK CATI BOYASI 3.KISIM	8-Jul-93	30	11-Aug-93	0	43	-43
CELIK CATI BOYASI 4.KISIM	12-Aug-93	30	16-Sep-93	0	43	-43
CELIK CATI BOYASI 5.KISIM	17-Sep-93	30	21-Oct-93	0	43	-43
TAVAN BOYASI 1.KISIM	15-Apr-93	30	19-May-93	0	0	0
TAVAN BOYASI 2.KISIM	20-May-93	30	25-Jun-93	0	103	0
TAVAN BOYASI 3.KISIM	26-Jun-93	30	30-Jul-93	0	103	-103
TAVAN BOYASI 4.KISIM	31-Jul-93	30	4-Sep-93	89	103	-14
TAVAN BOYASI 5.KISIM	19-Apr-93	30	22-May-93	57	160	57
IC KAPILARIN YAPILMASI	30-Apr-93	20	22-May-93	176	190	176
DIS SAC KAPILARIN YAPILMASI	1-Jun-93	30	7-Jul-93	0	0	0
AHSAP DOGRAMALARIN DEGISTIRILI	15-May-93	60	26-Jul-93	0	0	0
DIS CEPHE BOYASI	5-May-93	20	27-May-93	172	186	172
CATI TECRIDI TAMIRI	5-May-93	10	15-May-93	1	1	1
1600 LUK PRES TEMELI YAPIMI	15-Apr-93	30	19-May-93	0	0	0
2200 LUK PRES TEMELININ YAPIMI	3-May-93	30	8-Jun-93	0	73	0
FIRIN TEMELI	1-May-93	20	24-May-93	0	0	0
MONTAJ ISLERI	15-Feb-93	225	10-Nov-93	0	43	0
1600 LUK PRES MONTAJI	20-May-93	60	30-Jul-93	15	88	15
2200 LUK PRES MONTAJI	9-Jun-93	60	17-Aug-93	0	73	-73
ERITME FIRINI MONTAJI	25-May-93	60	4-Aug-93	81	124	81
MEVCUT TEZ.NAKLI	15-Feb-93	45	8-Apr-93	0	0	0
PANO MONTAJI	18-Aug-93	20	10-Sep-93	30	73	-43
OTOMASYON MONTAJI	16-Oct-93	20	10-Nov-93	0	43	-43
MEKANIK ISLER	15-May-93	134	21-Oct-93	49	63	49
ISITMA SISTEMI	1-Jun-93	75	28-Aug-93	0	0	0
HAVALANDIRMA SISTEMI	1-Jun-93	75	28-Aug-93	0	73	0
SICAK VE SOGUK SU BORULARI	1-Jun-93	60	11-Aug-93	0	63	0
KANALIZASYON SISTEMI	20-Jul-93	60	28-Sep-93	0	0	0



Highlights

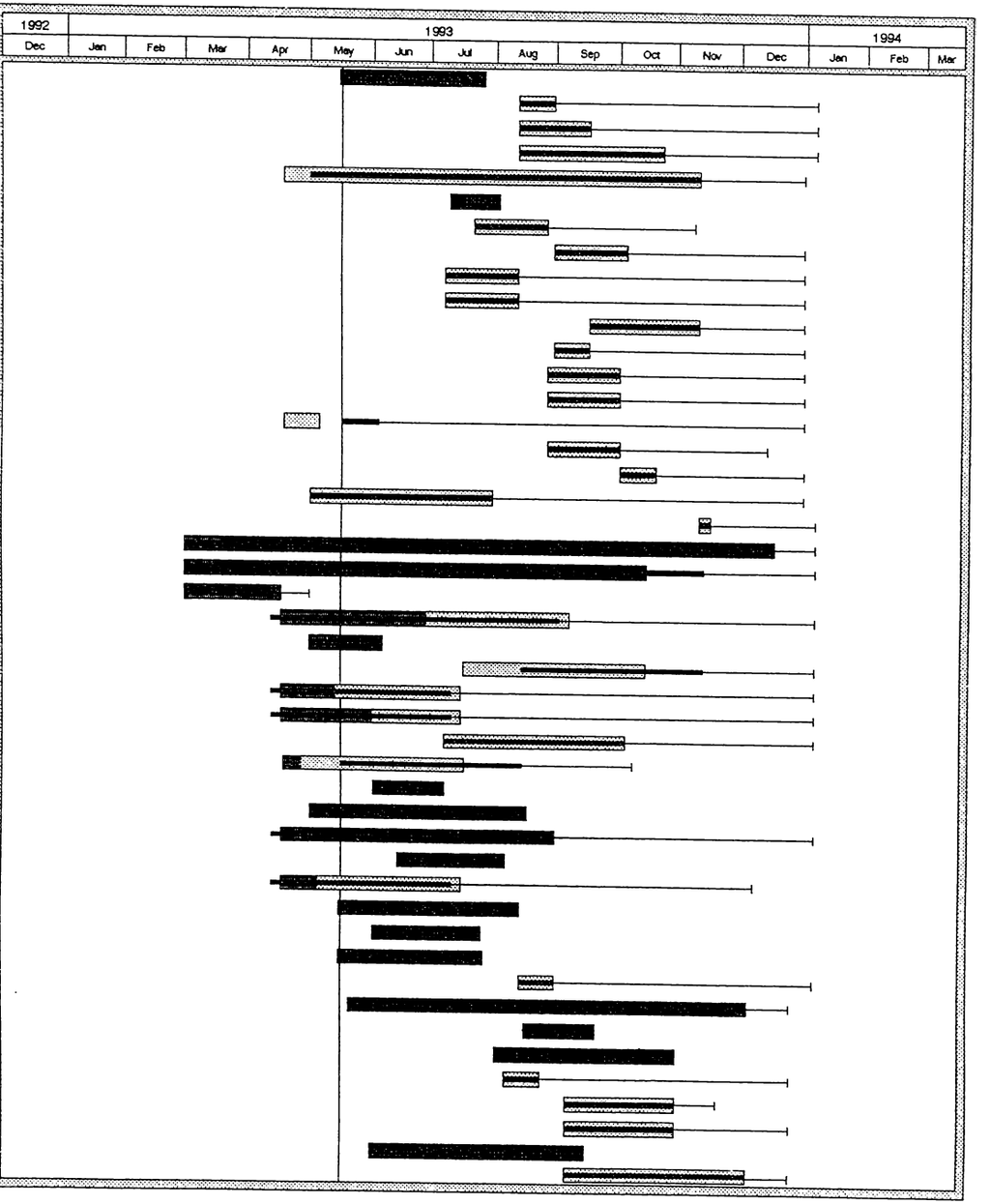
Baseline | Actual | Milestone | Slack

Critical Path

APPENDIX E

CPM CALCULATIONS

Task Name	Start Date	Duratn (Days)	End Date	FrSlack (Days)	TlSlack (Days)	Ind Slac (Days)
SIHHI TESISAT	15-May-93	60	26-Jul-93	0	0	0
YANGIN KORUMA	12-Aug-93	15	28-Aug-93	94	108	31
BASINCLI HAVA BORULARI	12-Aug-93	30	16-Sep-93	79	93	16
GAZ BORULARI	12-Aug-93	60	21-Oct-93	49	63	-14
ELEKTRIK ISLERI	1-May-93	161	10-Nov-93	0	43	0
ANA PANOLAR	10-Jul-93	20	2-Aug-93	0	0	0
YARDIMCI PANOLAR	22-Jul-93	30	25-Aug-93	0	61	0
TALI MEK. SISTEM OTOMAZISYONU	31-Aug-93	30	4-Oct-93	30	73	-43
ALCAK GERILIM KABLOLARI	8-Jul-93	30	11-Aug-93	0	118	-43
KABLO SAIR ISLERI	8-Jul-93	30	11-Aug-93	75	118	-43
AYDINLATMA TESISATI	17-Sep-93	45	10-Nov-93	0	43	-43
MOTOR SALTERLERI	31-Aug-93	15	16-Sep-93	45	88	45
YANGIN SINYALIZASYON	26-Aug-93	30	30-Sep-93	33	76	-28
YANGIN IHBAR	26-Aug-93	30	30-Sep-93	33	76	-28
TELEFON SISTEMI	17-May-93	15	2-Jun-93	133	176	133
SAAT SISTEMI	26-Aug-93	30	30-Sep-93	0	61	-61
RADYO-SES DUZENI	1-Oct-93	15	18-Oct-93	18	61	-43
TOPRAKLAMA VE PARATONER	1-May-93	75	29-Jul-93	86	129	86
ALUMINYUM BITISI	11-Nov-93	5	16-Nov-93	29	43	-14
IDARE BINASI	1-Mar-93	244	16-Dec-93	3	17	3
INSAAT ISLERI	1-Mar-93	215	12-Nov-93	32	46	32
DUVAR YIKILMASI	1-Mar-93	36	12-Apr-93	16	16	16
DUVAR BOYASI	13-Apr-93	120	2-Sep-93	91	105	91
ALUASMA TAVANLAR	1-May-93	30	7-Jun-93	0	0	0
MARLEY KAPLAMA	14-Aug-93	75	12-Nov-93	32	46	-14
SERAMIK KAPLAMALAR	13-Apr-93	75	10-Jul-93	136	150	136
FAYANS ISLERI	13-Apr-93	75	10-Jul-93	136	150	136
DIS CEPHE KAPLAMASI	8-Jul-93	75	4-Oct-93	64	78	64
AHSAP KAPILAR	17-May-93	75	13-Aug-93	0	46	0
DIS ALU KAPILAR	1-Jun-93	30	7-Jul-93	0	0	0
PENCERELERIN DEGISTIRILMESI	1-May-93	90	16-Aug-93	0	0	0
MEKANIK ISLER	13-Apr-93	118	31-Aug-93	93	107	93
ISITMA SISTEMI	15-Jun-93	45	5-Aug-93	0	0	0
VANTILASYON SISTEMI	13-Apr-93	75	10-Jul-93	22	125	22
SU BORULARI	15-May-93	75	12-Aug-93	0	0	0
KANALIZASYON	1-Jun-93	45	24-Jul-93	0	0	0
SIHHI TESISAT	15-May-93	60	26-Jul-93	0	0	0
YANGIN DOLAPLARI	13-Aug-93	15	31-Aug-93	93	107	93
ELEKTRIK ISLERI	20-May-93	166	4-Dec-93	0	17	0
ANA PANOLAR	16-Aug-93	30	20-Sep-93	0	0	0
TALI PANOLAR	2-Aug-93	75	28-Oct-93	0	0	0
YAR.MEK.SITEM OTOMAZISYONU	6-Aug-93	15	23-Aug-93	86	103	-17
KABLOLAR	7-Sep-93	45	28-Oct-93	0	17	0
KABLO TEFERRUATI	7-Sep-93	45	28-Oct-93	30	47	13
AYDINLATMA SISTEMI	31-May-93	90	15-Sep-93	0	0	0
YANGIN SINYALIZASYONU	7-Sep-93	75	4-Dec-93	0	17	-17



Highlights

Baseline

Actual

Milestone

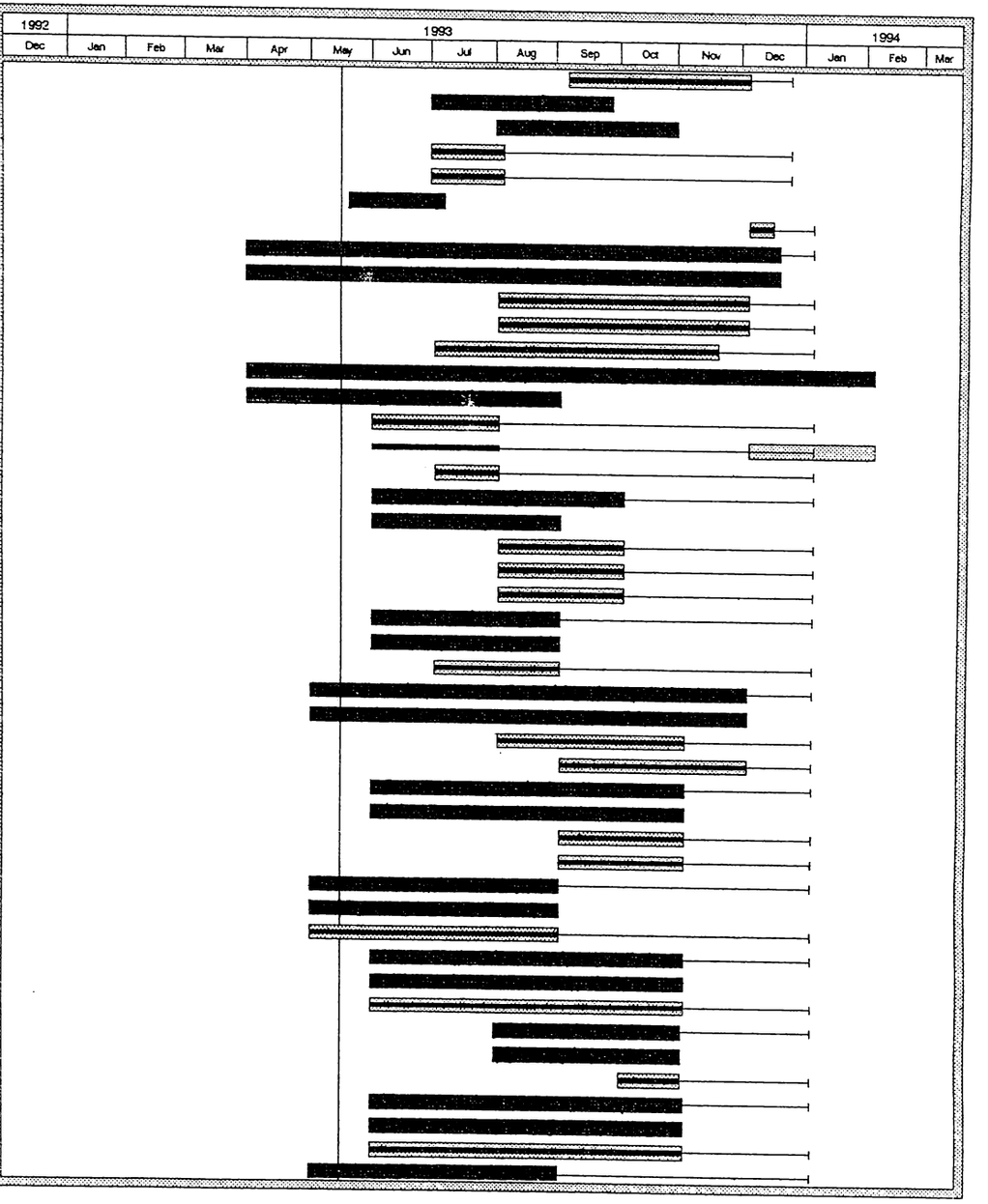
Slack

Critical Path

APPENDIX E

CPM CALCULATIONS

Task Name	Start Date	Duratn (Days)	End Date	FrSlack (Days)	TlSlack (Days)	Ind Slac (Days)
YANGIN IHBAR	7-Sep-93	75	4-Dec-93	0	17	-17
TELEFON SISTEMI	1-Jul-93	75	27-Sep-93	0	0	0
GUVENLIK SINYALIZASYONU	2-Aug-93	75	28-Oct-93	0	0	0
SAAT SISTEMI	1-Jul-93	30	4-Aug-93	0	119	0
RADYO SISTEMI	1-Jul-93	30	4-Aug-93	102	119	-17
TOPR. VE PARATONER SISTEMI	20-May-93	40	7-Jul-93	0	0	0
IDARE BIN.BITISI	6-Dec-93	10	16-Dec-93	3	17	-14
KAZAN DAIRESI	1-Apr-93	221	20-Dec-93	0	14	0
INSAAT ISLERI	1-Apr-93	221	20-Dec-93	0	0	0
ELEKTRIK ISLERI	3-Aug-93	104	4-Dec-93	13	27	-14
MEKANIK ISLER	3-Aug-93	104	4-Dec-93	0	27	0
MONTAJ ISLERI	3-Jul-93	117	19-Nov-93	26	40	26
KOMPRESOR BINASI	1-Apr-93	130	2-Sep-93	91	105	91
INSAAT ISLERI	1-Apr-93	130	2-Sep-93	0	0	0
MEKANIK ISLER	1-Jun-93	52	2-Aug-93	0	131	0
ELEKTRIK ISLERI	1-Jun-93	52	2-Aug-93	117	131	-14
MONTAJ ISLERI	3-Jul-93	26	2-Aug-93	117	131	117
POMPA ISTASYONU	1-Jun-93	104	2-Oct-93	65	79	65
INSAAT ISLERI	1-Jun-93	78	2-Sep-93	0	0	0
MEKANIK ISLER	3-Aug-93	52	2-Oct-93	65	79	65
ELEKTRIK ISLERI	3-Aug-93	52	2-Oct-93	65	79	65
MONTAJ ISLERI	3-Aug-93	52	2-Oct-93	65	79	65
GIRIS KAPISI	1-Jun-93	78	2-Sep-93	91	105	91
INSAAT ISLERI	1-Jun-93	78	2-Sep-93	0	0	0
ELEKTRIK ISLERI	3-Jul-93	52	2-Sep-93	91	105	91
KANAL.POMPA IST	1-May-93	182	4-Dec-93	13	27	13
INSAAT ISLERI	1-May-93	182	4-Dec-93	0	0	0
ELEKTRIK ISLERI	3-Aug-93	78	4-Nov-93	39	53	39
MONTAJ ISLERI	3-Sep-93	78	4-Dec-93	13	27	13
YAGMUR SUYU TANKI	1-Jun-93	130	4-Nov-93	39	53	39
INSAAT ISLERI	1-Jun-93	130	4-Nov-93	0	0	0
ELEKTRIK ISLERI	3-Sep-93	52	4-Nov-93	39	53	39
MONTAJ ISLERI	3-Sep-93	52	4-Nov-93	39	53	39
SAHA KANALIZASYON	1-May-93	104	2-Sep-93	91	105	91
INSAAT ISLERI	1-May-93	104	2-Sep-93	0	0	0
MEKANIK ISLER	1-May-93	104	2-Sep-93	91	105	91
SICAK SU SEBEKES	1-Jun-93	130	4-Nov-93	39	53	39
INSAAT ISLERI	1-Jun-93	130	4-Nov-93	0	0	0
MEKANIK ISLER	1-Jun-93	130	4-Nov-93	39	53	39
YAGM SU ARITMA	2-Aug-93	78	3-Nov-93	40	54	40
INSAAT ISLERI	2-Aug-93	78	3-Nov-93	0	0	0
MONTAJ ISLERI	2-Oct-93	26	3-Nov-93	40	54	40
SAH.YAG.SUYU TOPLAMA	1-Jun-93	130	4-Nov-93	39	53	39
INSAAT ISLERI	1-Jun-93	130	4-Nov-93	0	0	0
MEKANIK ISLER	1-Jun-93	130	4-Nov-93	39	53	39
GAZ VE BA HAVA SEBEKESI	1-May-93	104	2-Sep-93	91	105	91



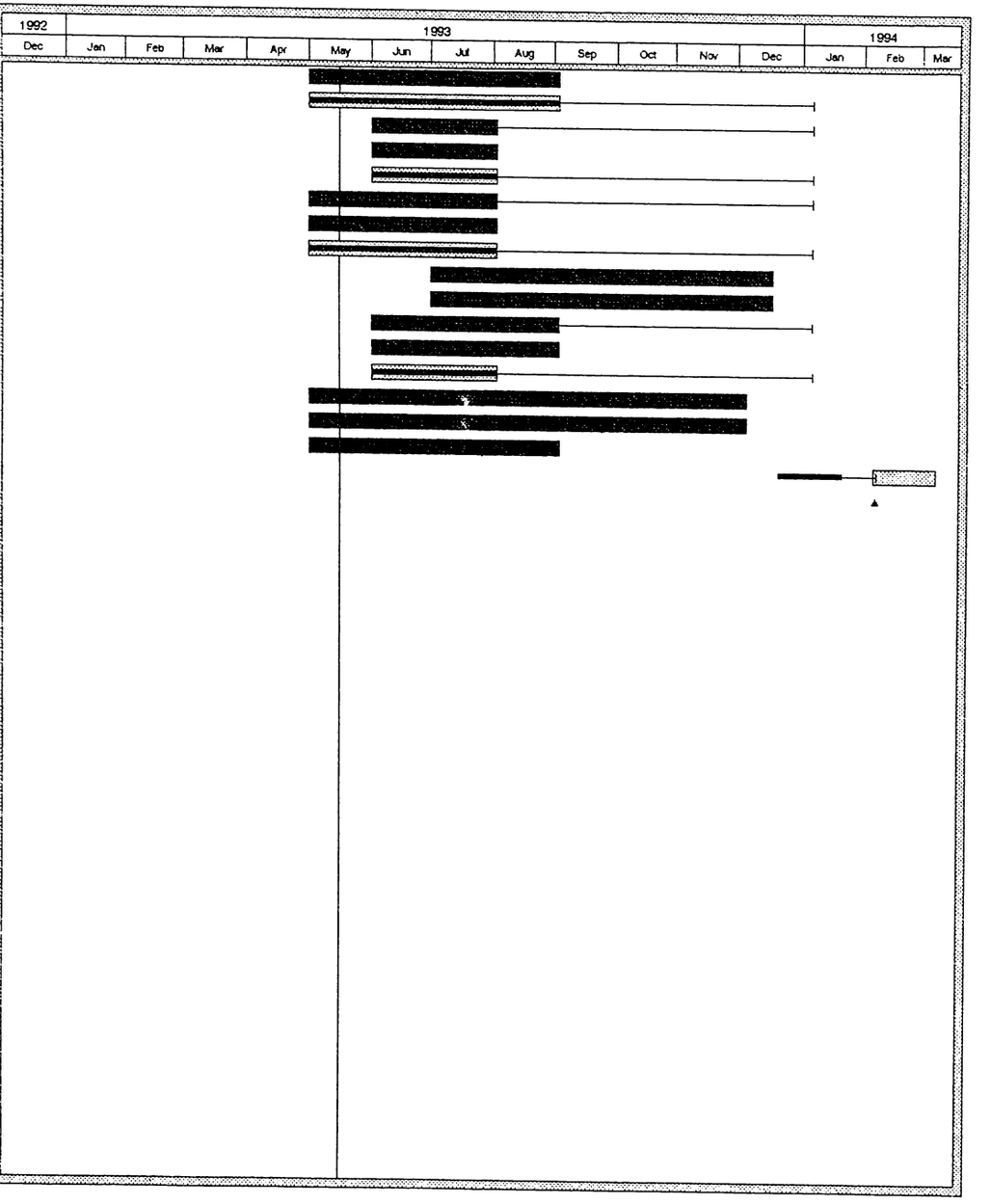
Highlights: Baseline, Actual, Milestone, Slack

Critical Path

APPENDIX E

CPM CALCULATIONS

Task Name	Start Date	Durstn (Days)	End Date	FrSlack (Days)	TiSlack (Days)	Ind Slac (Days)
INSAAT ISLERI	1-May-93	104	2-Sep-93	0	0	0
MEKANIK ISLER	1-May-93	104	2-Sep-93	91	105	91
SAHA 1 KV ELEKTRIKI	1-Jun-93	52	2-Aug-93	117	131	117
INSAAT ISLERI	1-Jun-93	52	2-Aug-93	0	0	0
ELEKTRIK ISLERI	1-Jun-93	52	2-Aug-93	117	131	117
SAHA 10 KV DAGITIM	1-May-93	78	2-Aug-93	117	131	117
INSAAT ISLERI	1-May-93	78	2-Aug-93	0	0	0
ELEKTRIK ISLERI	1-May-93	78	2-Aug-93	117	131	117
SAHA YOLLARI	1-Jul-93	143	17-Dec-93	0	0	0
INSAAT ISLERI	1-Jul-93	143	17-Dec-93	0	0	0
CEVRE DUVARI	1-Jun-93	78	2-Sep-93	91	105	91
INSAAT ISLERI	1-Jun-93	78	2-Sep-93	0	0	0
ELEKTRIK ISLERI	1-Jun-93	52	2-Aug-93	117	131	117
SAHA DISI ISLER	1-May-93	182	4-Dec-93	0	0	0
DIS YOLLAR	1-May-93	182	4-Dec-93	0	0	0
10 KV.KABLO DOSENMESI	1-May-93	104	2-Sep-93	0	0	0
GECICI KABUL	21-Dec-93	26	20-Jan-94	14	14	0
ISIN BITISI	7-Feb-94	0	7-Feb-94	0	0	0



Highlights

Baseline | Actual | Milestone | Slack

Critical Path

APPENDIX F

C/SSR REPORT

(Cost Schedule Status Report)

WBS : A project is broken into several tasks. It is called Work Breakdown Structure. And each task has a WBS number.

Task Name : The full name of the task.

Bsln Elapsed $ (BCWS) : The value of the work, in dollars, that was budgeted (baseline) to date.

Achieved Dollars (BCWP) : Achieved value, expressed in baseline dollars.....(Percent Completion * BAC).

Spent Dollars (ACWP) : The total actual dollars spent on a task.

Schedule Variance : Schedule progress (*0* = O.K., *Negative* = Behind Schedule, *Positive* = Ahead).....(BCWP - BCWS).

Cost Variance : Cost Progress (*0* = O.K., *Negative* = Over

Baseline, *Positive* = Under Baseline).....(BCWP - ACWP).

Bsln Effort : The task effort at the time the baseline is set.

Total Dollars (EAC) : Estimate of total task cost (sum of current plan resource / cost assignments).

EAC Variance : Status at completion (*0* = Forecast O.K., *Negative* = Over Budgeted, *Positive* = Under Budgeted)..... (BAC - EAC)

Bsln Total $ (BAC) : The task cost at the time the baseline is set.

APPENDIX F

COST SCHEDULE STATUS REPORT (C/SSR)

WBS Code	Task Name	Elpsd BL $ (BCWS)	Achieved $ (BCWP)	Spent $ (ACWP)	Schedule Variance	Cost Variance	Bsln Effor	Total $ (EAC)	EAC Variance	Total BL $ (BAC)
0.00	1.SAHA ISLERI	2, 291, 259. 92	1, 873, 077. 80	0. 00	- 418, 182. 12	1, 873, 077. 80		10, 178, 006. 00	0. 00	10, 178, 006. 00
0.10	GENEL ISLER	274, 556. 21	240, 000. 00	0. 00	- 34, 556. 21	240, 000. 00		800, 000. 00	0. 00	800, 000. 00
0.20	MOBILIZASYON	1, 483, 333. 33	1, 400, 000. 00	0. 00	- 83, 333. 33	1, 400, 000. 00		2, 000, 000. 00	0. 00	2, 000, 000. 00
1.00	ALUMINYUM EKZTRUZYON	147, 082. 80	140, 073. 80	0. 00	- 7, 009. 00	140, 073. 80		2, 402, 786. 00	0. 00	2, 402, 786. 00
1.1.0	INSAAT ISLERI	134, 692. 80	134, 683. 80	0. 00	- 9. 00	134, 683. 80		875, 756. 00	0. 00	875, 756. 00
1.1.1	DUVARLARIN YIKILMASI	1, 632. 00	1, 632. 00	0. 00	0. 00	1, 632. 00		1, 632. 00	0. 00	1, 632. 00
1.1.2	YENI DUVAR YAPIMI	1, 195. 64	1, 972. 80	0. 00	777. 16	1, 972. 80		2, 192. 00	0. 00	2, 192. 00
1.1.3.1	DOSEME BETONU 1.BOLUM	22, 048. 00	0. 00	0. 00	- 22, 048. 00	0. 00		25, 440. 00	0. 00	25, 440. 00
1.1.3.2	DOSEME BETONU 2.BOLUM	0. 00	0. 00	0. 00	0. 00	0. 00		25, 440. 00	0. 00	25, 440. 00
1.1.3.3	DOSEME BETONU 3.BOLUM	0. 00	0. 00	0. 00	0. 00	0. 00		25, 440. 00	0. 00	25, 440. 00
1.1.3.4	DOSEME BETONU 4.BOLUM	0. 00	0. 00	0. 00	0. 00	0. 00		25, 440. 00	0. 00	25, 440. 00
1.1.3.5	DOSEME BETONU 5.BOLUM	0. 00	0. 00	0. 00	0. 00	0. 00		25, 440. 00	0. 00	25, 440. 00
1.1.4	SIVA ISLERI	0. 00	2, 184. 00	0. 00	2, 184. 00	2, 184. 00		3, 120. 00	0. 00	3, 120. 00
1.1.5	IC DUVAR BOYALARI	0. 00	0. 00	0. 00	0. 00	0. 00		2, 200. 00	0. 00	2, 200. 00
1.1.6	KOLON SAC KAPLAMASI	0. 00	0. 00	0. 00	0. 00	0. 00		6, 772. 00	0. 00	6, 772. 00
1.1.7	DUVAR FAYANS KAPLAMASI	0. 00	15, 600. 00	0. 00	15, 600. 00	15, 600. 00		39, 000. 00	0. 00	39, 000. 00
1.1.8.1	CELIK CATI BOYASI 1.KS	15, 912. 00	0. 00	0. 00	- 15, 912. 00	0. 00		28, 080. 00	0. 00	28, 080. 00
1.1.8.2	CELIK CATI BOYASI 2.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		28, 080. 00	0. 00	28, 080. 00
1.1.8.3	CELIK CATI BOYASI 3.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		28, 080. 00	0. 00	28, 080. 00
1.1.8.4	CELIK CATI BOYASI 4.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		28, 080. 00	0. 00	28, 080. 00
1.1.8.5	CELIK CATI BOYASI 5.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		28, 080. 00	0. 00	28, 080. 00
1.1.9.1	TAVAN BOYASI 1.KISIM	10, 062. 00	1, 118. 00	0. 00	- 8, 944. 00	1, 118. 00		11, 180. 00	0. 00	11, 180. 00
1.1.9.2	TAVAN BOYASI 2.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		11, 180. 00	0. 00	11, 180. 00
1.1.9.3	TAVAN BOYASI 3.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		11, 180. 00	0. 00	11, 180. 00
1.1.9.4	TAVAN BOYASI 4.KISIM	0. 00	0. 00	0. 00	0. 00	0. 00		11, 180. 00	0. 00	11, 180. 00
1.1.9.5	TAVAN BOYASI 5.KISIM	8, 944. 00	10, 062. 00	0. 00	1, 118. 00	10, 062. 00		11, 180. 00	0. 00	11, 180. 00
1.1.10	IC KAPILARIN YAPILMASI	0. 00	960. 00	0. 00	960. 00	960. 00		4, 800. 00	0. 00	4, 800. 00
1.1.11	DIS SAC KAPILARIN YAPILMASI	0. 00	0. 00	0. 00	0. 00	0. 00		2, 400. 00	0. 00	2, 400. 00
1.1.12	AHSAP DOGRAMALARIN DEGISTIRILI	5, 666. 67	0. 00	0. 00	- 5, 666. 67	0. 00		340, 000. 00	0. 00	340, 000. 00
1.13	DIS CEPHE BOYASI	0. 00	832. 00	0. 00	832. 00	832. 00		8, 320. 00	0. 00	8, 320. 00
1.1.14	CATI TECRIDI TAMIRI	0. 00	33, 120. 00	0. 00	33, 120. 00	33, 120. 00		33, 120. 00	0. 00	33, 120. 00
1.1.15.1	1600 LUK PRES TEMELI YAPIMI	32, 886. 00	32, 886. 00	0. 00	0. 00	32, 886. 00		36, 540. 00	0. 00	36, 540. 00
1.1.15.2	2200 LUK PRES TEMELININ YAPIMI	16, 892. 00	25, 338. 00	0. 00	8, 446. 00	25, 338. 00		42, 230. 00	0. 00	42, 230. 00
1.1.15.3	FIRIN TEMELI	19, 454. 50	8, 979. 00	0. 00	- 10, 475. 50	8, 979. 00		29, 930. 00	0. 00	29, 930. 00
1.2.0	MONTAJ ISLERI	5, 390. 00	5, 390. 00	0. 00	0. 00	5, 390. 00		65, 410. 00	0. 00	65, 410. 00
1.2.1	1600 LUK PRES MONTAJI	0. 00	0. 00	0. 00	0. 00	0. 00		17, 240. 00	0. 00	17, 240. 00
1.2.2	2200 LUK PRES MONTAJI	0. 00	0. 00	0. 00	0. 00	0. 00		19, 400. 00	0. 00	19, 400. 00
1.2.3	ERITME FIRINI MONTAJI	0. 00	0. 00	0. 00	0. 00	0. 00		19, 540. 00	0. 00	19, 540. 00
1.2.4	MEVCUT TEZNAKLI	5, 390. 00	5, 390. 00	0. 00	0. 00	5, 390. 00		5, 390. 00	0. 00	5, 390. 00
1.2.5	PANO MONTAJI	0. 00	0. 00	0. 00	0. 00	0. 00		2, 080. 00	0. 00	2, 080. 00
1.2.6	OTOMASYON MONTAJI	0. 00	0. 00	0. 00	0. 00	0. 00		1, 760. 00	0. 00	1, 760. 00
1.3.0	MEKANIK ISLER	200. 00	0. 00	0. 00	- 200. 00	0. 00		1, 126, 000. 00	0. 00	1, 126, 000. 00
1.3.1	ISITMA SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		260, 000. 00	0. 00	260, 000. 00
1.3.2	HAVALANDIRMA SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		420, 000. 00	0. 00	420, 000. 00

APPENDIX F

COST SCHEDULE STATUS REPORT (C/SSR)

WBS Code	Task Name	Elpsd BL $ (BCWS)	Achieved $ (BCWP)	Spent $ (ACWP)	Schedule Variance	Cost Variance	Bsln Effor	Total $ (EAC)	EAC Variance	Total BL $ (BAC)
1.3.3	SICAK VE SOGUK SU BORULARI	0. 00	0. 00	0. 00	0. 00	0. 00		80, 000. 00	0. 00	80, 000. 00
1.3.4	KANALIZASYON SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		33, 000. 00	0. 00	33, 000. 00
1.3.5	SIHHI TESISAT	200. 00	0. 00	0. 00	-200. 00	0. 00		12, 000. 00	0. 00	12, 000. 00
1.3.6	YANGIN KORUMA	0. 00	0. 00	0. 00	0. 00	0. 00		150, 000. 00	0. 00	150, 000. 00
1.3.7	BASINCLI HAVA BORULARI	0. 00	0. 00	0. 00	0. 00	0. 00		77, 000. 00	0. 00	77, 000. 00
1.3.8	GAZ BORULARI	0. 00	0. 00	0. 00	0. 00	0. 00		94, 000. 00	0. 00	94, 000. 00
1.4.0	ELEKTRIK ISLERI	6, 800. 00	0. 00	0. 00	-6, 800. 00	0. 00		335, 620. 00	0. 00	335, 620. 00
1.4.1	ANA PANOLAR	0. 00	0. 00	0. 00	0. 00	0. 00		1, 120. 00	0. 00	1, 120. 00
1.4.2	YARDIMCI PANOLAR	0. 00	0. 00	0. 00	0. 00	0. 00		13, 000. 00	0. 00	13, 000. 00
1.4.3	TALI MEK. SISTEM OTOMAZISYONU	0. 00	0. 00	0. 00	0. 00	0. 00		18, 000. 00	0. 00	18, 000. 00
1.4.4	ALCAK GERILIM KABLOLARI	0. 00	0. 00	0. 00	0. 00	0. 00		125, 000. 00	0. 00	125, 000. 00
1.4.5	KABLO SAIR ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		49, 000. 00	0. 00	49, 000. 00
1.4.6	AYDINLATMA TESISATI	0. 00	0. 00	0. 00	0. 00	0. 00		91, 000. 00	0. 00	91, 000. 00
1.4.7	MOTOR SALTERLERI	0. 00	0. 00	0. 00	0. 00	0. 00		600. 00	0. 00	600. 00
1.4.8	YANGIN SINYALIZASYON	0. 00	0. 00	0. 00	0. 00	0. 00		11, 000. 00	0. 00	11, 000. 00
1.4.9	YANGIN IHBAR	0. 00	0. 00	0. 00	0. 00	0. 00		3, 500. 00	0. 00	3, 500. 00
1.4.10	TELEFON SISTEMI	4, 200. 00	0. 00	0. 00	-4, 200. 00	0. 00		4, 200. 00	0. 00	4, 200. 00
1.4.11	SAAT SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		700. 00	0. 00	700. 00
1.4.12	RADYO-SES DUZENI	0. 00	0. 00	0. 00	0. 00	0. 00		3, 500. 00	0. 00	3, 500. 00
1.4.13	TOPRAKLAMA VE PARATONER	2, 600. 00	0. 00	0. 00	-2, 600. 00	0. 00		15, 000. 00	0. 00	15, 000. 00
1.9	ALUMINYUM BITISI	0. 00	0. 00	0. 00	0. 00	0. 00		0. 00	0. 00	0. 00
2.0	IDARE BINASI	103, 479. 44	63, 004. 00	0. 00	-40, 475. 44	63, 004. 00		1, 073, 220. 00	0. 00	1, 073, 220. 00
2.1	INSAAT ISLERI	87, 592. 78	44, 904. 00	0. 00	-42, 688. 78	44, 904. 00		529, 260. 00	0. 00	529, 260. 00
2.1.1	DUVAR YIKILMASI	5, 440. 00	5, 440. 00	0. 00	0. 00	5, 440. 00		5, 440. 00	0. 00	5, 440. 00
2.1.2	DUVAR BOYASI	5, 775. 00	13, 860. 00	0. 00	8, 085. 00	13, 860. 00		27, 720. 00	0. 00	27, 720. 00
2.1.3	ALU.ASMA TAVANLAR	9, 394. 67	8, 672. 00	0. 00	-722. 67	8, 672. 00		21, 680. 00	0. 00	21, 680. 00
2.1.4	MARLEY KAPLAMA	0. 00	0. 00	0. 00	0. 00	0. 00		94, 920. 00	0. 00	94, 920. 00
2.1.5	SERAMIK KAPLAMALAR	3, 213. 33	2, 892. 00	0. 00	-321. 33	2, 892. 00		9, 640. 00	0. 00	9, 640. 00
2.1.6	FAYANS ISLERI	4, 280. 00	6, 420. 00	0. 00	2, 140. 00	6, 420. 00		12, 840. 00	0. 00	12, 840. 00
2.1.7	DIS CEPHE KAPLAMASI	0. 00	0. 00	0. 00	0. 00	0. 00		18, 600. 00	0. 00	18, 600. 00
2.1.8	AHSAP KAPILAR	24, 384. 00	7, 620. 00	0. 00	-16, 764. 00	7, 620. 00		76, 200. 00	0. 00	76, 200. 00
2.1.9	DIS ALU.KAPILAR	0. 00	0. 00	0. 00	0. 00	0. 00		19, 180. 00	0. 00	19, 180. 00
2.1.10	PENCERELERIN DEGISTIRILMESI	35, 105. 78	0. 00	0. 00	-35, 105. 78	0. 00		243, 040. 00	0. 00	243, 040. 00
2.2	MEKANIK ISLER	15, 886. 67	18, 100. 00	0. 00	2, 213. 33	18, 100. 00		216, 960. 00	0. 00	216, 960. 00
2.2.1	ISITMA SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		0. 00	0. 00	0. 00
2.2.2	VANTILASYON SISTEMI	14, 000. 00	8, 400. 00	0. 00	-5, 600. 00	8, 400. 00		42, 000. 00	0. 00	42, 000. 00
2.2.3	SU BORULARI	720. 00	2, 700. 00	0. 00	1, 980. 00	2, 700. 00		54, 000. 00	0. 00	54, 000. 00
2.2.4	KANALIZASYON	0. 00	0. 00	0. 00	0. 00	0. 00		50, 000. 00	0. 00	50, 000. 00
2.2.5	SIHHI TESISAT	1, 166. 67	7, 000. 00	0. 00	5, 833. 33	7, 000. 00		70, 000. 00	0. 00	70, 000. 00
2.2.6	YANGIN DOLAPLARI	0. 00	0. 00	0. 00	0. 00	0. 00		960. 00	0. 00	960. 00
2.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		327, 000. 00	0. 00	327, 000. 00
2.3.1	ANA PANOLAR	0. 00	0. 00	0. 00	0. 00	0. 00		2, 000. 00	0. 00	2, 000. 00
2.3.2	TALI PANOLAR	0. 00	0. 00	0. 00	0. 00	0. 00		25, 000. 00	0. 00	25, 000. 00
2.3.3	YAR.MEK.SITEM OTOMAZISYONU	0. 00	0. 00	0. 00	0. 00	0. 00		12, 000. 00	0. 00	12, 000. 00

APPENDIX F

COST SCHEDULE STATUS REPORT (C/SSR)

WBS Code	Task Name	Elpsd BL $ (BCWS)	Achieved $ (BCWP)	Spent $ (ACWP)	Schedule Variance	Cost Variance	Bsln Effor	Total $ (EAC)	EAC Variance	Total BL $ (BAC)
2.3.4	KABLOLAR	0. 00	0. 00	0. 00	0. 00	0. 00		80, 000. 00	0. 00	80, 000. 00
2.3.5	KABLO TEFERRUATI	0. 00	0. 00	0. 00	0. 00	0. 00		35, 000. 00	0. 00	35, 000. 00
2.3.6	AYDINLATMA SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		100, 000. 00	0. 00	100, 000. 00
2.3.8	YANGIN SINYALIZASYONU	0. 00	0. 00	0. 00	0. 00	0. 00		25, 000. 00	0. 00	25, 000. 00
2.3.9	YANGIN IHBAR	0. 00	0. 00	0. 00	0. 00	0. 00		10, 000. 00	0. 00	10, 000. 00
2.3.10	TELEFON SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		18, 000. 00	0. 00	18, 000. 00
2.3.11	GUVENLIK SINYALIZASYONU	0. 00	0. 00	0. 00	0. 00	0. 00		3, 000. 00	0. 00	3, 000. 00
2.3.12	SAAT SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		1, 000. 00	0. 00	1, 000. 00
2.3.13	RADYO SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		6, 000. 00	0. 00	6, 000. 00
2.3.14	TOPR. VE PARATONER SISTEMI	0. 00	0. 00	0. 00	0. 00	0. 00		10, 000. 00	0. 00	10, 000. 00
2.9	IDARE BIN.BITISI	0. 00	0. 00	0. 00	0. 00	0. 00		0. 00	0. 00	0. 00
3.0	KAZAN DAIRESI	44, 117. 65	0. 00	0. 00	- 44, 117. 65	0. 00		500, 000. 00	0. 00	500, 000. 00
3.1	INSAAT ISLERI	44, 117. 65	0. 00	0. 00	- 44, 117. 65	0. 00		250, 000. 00	0. 00	250, 000. 00
3.2	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		60, 000. 00	0. 00	60, 000. 00
3.3	MEKANIK ISLER	0. 00	0. 00	0. 00	0. 00	0. 00		40, 000. 00	0. 00	40, 000. 00
3.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		150, 000. 00	0. 00	150, 000. 00
5.0	KOMPRESOR BINASI	45, 000. 00	30, 000. 00	0. 00	- 15, 000. 00	30, 000. 00		255, 000. 00	0. 00	255, 000. 00
5.1	INSAAT ISLERI	45, 000. 00	30, 000. 00	0. 00	- 15, 000. 00	30, 000. 00		150, 000. 00	0. 00	150, 000. 00
5.2	MEKANIK ISLER	0. 00	0. 00	0. 00	0. 00	0. 00		40, 000. 00	0. 00	40, 000. 00
5.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		30, 000. 00	0. 00	30, 000. 00
5.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		35, 000. 00	0. 00	35, 000. 00
6.0	POMPA ISTASYONU	0. 00	0. 00	0. 00	0. 00	0. 00		51, 000. 00	0. 00	51, 000. 00
6.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		10, 000. 00	0. 00	10, 000. 00
6.2	MEKANIK ISLER	0. 00	0. 00	0. 00	0. 00	0. 00		6, 000. 00	0. 00	6, 000. 00
6.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		20, 000. 00	0. 00	20, 000. 00
6.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		15, 000. 00	0. 00	15, 000. 00
7.0	GIRIS KAPISI	0. 00	0. 00	0. 00	0. 00	0. 00		9, 000. 00	0. 00	9, 000. 00
7.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		6, 000. 00	0. 00	6, 000. 00
7.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		3, 000. 00	0. 00	3, 000. 00
8.0	KANAL.POMPA IST	6, 428. 57	0. 00	0. 00	- 6, 428. 57	0. 00		141, 000. 00	0. 00	141, 000. 00
8.1	INSAAT ISLERI	6, 428. 57	0. 00	0. 00	- 6, 428. 57	0. 00		90, 000. 00	0. 00	90, 000. 00
8.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		25, 000. 00	0. 00	25, 000. 00
8.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		26, 000. 00	0. 00	26, 000. 00
10.0	YAGMUR SUYU TANKI	0. 00	0. 00	0. 00	0. 00	0. 00		81, 000. 00	0. 00	81, 000. 00
10.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		60, 000. 00	0. 00	60, 000. 00
10.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		6, 000. 00	0. 00	6, 000. 00
10.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		15, 000. 00	0. 00	15, 000. 00
9.0	SAHA KANALIZASYON	55, 625. 00	0. 00	0. 00	- 55, 625. 00	0. 00		445, 000. 00	0. 00	445, 000. 00
9.1	INSAAT ISLERI	33, 125. 00	0. 00	0. 00	- 33, 125. 00	0. 00		265, 000. 00	0. 00	265, 000. 00
9.2	MEKANIK ISLER	22, 500. 00	0. 00	0. 00	- 22, 500. 00	0. 00		180, 000. 00	0. 00	180, 000. 00
11.0	SICAK SU SEBEKES	0. 00	0. 00	0. 00	0. 00	0. 00		275, 000. 00	0. 00	275, 000. 00
11.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		75, 000. 00	0. 00	75, 000. 00
11.2	MEKANIK ISLER	0. 00	0. 00	0. 00	0. 00	0. 00		200, 000. 00	0. 00	200, 000. 00
12.0	YAGM.SU ARITMA	0. 00	0. 00	0. 00	0. 00	0. 00		60, 000. 00	0. 00	60, 000. 00

APPENDIX F

COST SCHEDULE STATUS REPORT (C/SSR)

WBS Code	Task Name	Elpsd BL $ (BCWS)	Achieved $ (BCWP)	Spent $ (ACWP)	Schedule Variance	Cost Variance	Bsln Effor	Total $ (EAC)	EAC Variance	Total BL $ (BAC)
12.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		40, 000. 00	0. 00	40, 000. 00
12.4	MONTAJ ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		20, 000. 00	0. 00	20, 000. 00
14.0	SAH.YAG.SUYU TOPLAMA	0. 00	0. 00	0. 00	0. 00	0. 00		150, 000. 00	0. 00	150, 000. 00
14.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		40, 000. 00	0. 00	40, 000. 00
14.2	MEKANIK ISLER	0. 00	0. 00	0. 00	0. 00	0. 00		110, 000. 00	0. 00	110, 000. 00
15.0	GAZ VE BA.HAVA SEBEKESI	19, 375. 00	0. 00	0. 00	-19, 375. 00	0. 00		155, 000. 00	0. 00	155, 000. 00
15.1	INSAAT ISLERI	4, 375. 00	0. 00	0. 00	-4, 375. 00	0. 00		35, 000. 00	0. 00	35, 000. 00
15.2	MEKANIK ISLER	15, 000. 00	0. 00	0. 00	-15, 000. 00	0. 00		120, 000. 00	0. 00	120, 000. 00
16.0	SAHA 1 KV ELEKTRIKI	0. 00	0. 00	0. 00	0. 00	0. 00		195, 000. 00	0. 00	195, 000. 00
16.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		50, 000. 00	0. 00	50, 000. 00
16.3	ELEKTRIK ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		145, 000. 00	0. 00	145, 000. 00
17.0	SAHA 10 KV DAGITIM	50, 833. 33	0. 00	0. 00	-50, 833. 33	0. 00		305, 000. 00	0. 00	305, 000. 00
17.1	INSAAT ISLERI	10, 833. 33	0. 00	0. 00	-10, 833. 33	0. 00		65, 000. 00	0. 00	65, 000. 00
17.3	ELEKTRIK ISLERI	40, 000. 00	0. 00	0. 00	-40, 000. 00	0. 00		240, 000. 00	0. 00	240, 000. 00
18.0	SAHA YOLLARI	0. 00	0. 00	0. 00	0. 00	0. 00		350, 000. 00	0. 00	350, 000. 00
18.1	INSAAT ISLERI	0. 00	0. 00	0. 00	0. 00	0. 00		350, 000. 00	0. 00	350, 000. 00
19.0	CEVRE DUVARI	0. 00	0. 00	0. 00	0. 00	0. 00		160, 000. 00	0. 00	160, 000. 00
19.1	INSAAT ISLERI	0 00	0. 00	0. 00	0. 00	0. 00		100, 000. 00	0. 00	100, 000. 00
19.3	ELEKTRIK ISLERI	0 00	0. 00	0. 00	0. 00	0. 00		60, 000. 00	0. 00	60, 000. 00
20.0	SAHA DISI ISLER	61, 428. 57	0. 00	0. 00	-61, 428. 57	0. 00		770, 000. 00	0. 00	770, 000. 00
20.1	DIS YOLLAR	46, 428. 57	0. 00	0. 00	-46, 428. 57	0. 00		650, 000. 00	0. 00	650, 000. 00
20.3	10 KV.KABLO DOSENMESI	15, 000. 00	0. 00	0. 00	-15, 000. 00	0. 00		120, 000. 00	0. 00	120, 000. 00
50.0	GECICI KABUL	0. 00	0. 00	0. 00	0. 00	0. 00		0. 00	0. 00	0. 00
	ISIN BITISI		0. 00	0. 00				0. 00		

APPENDIX G

TASK DEPENDENCIES

Schedule Name : Russia Project
Responsible : Murat KOMURCU
As-of Date : 17-May-93 Schedule File : RS(17-5)

MBA THESIS

Task Name

0.00 - 1.SAHA ISLERI

Successors

- ISIN BITISI (E->S)

Task Name

0.10 - GENEL ISLER

Task Name

0.20 - MOBILIZASYON

Task Name

1.00 - ALUMINYUM EKZTRUZYON

Successors

50.0 - GECICI KABUL (E->S)

Task Name

1.1.0 - INSAAT ISLERI

Task Name

1.1.1 - DUVARLARIN YIKILMASI

Successors

1.1.2 - YENI DUVAR YAPIMI (E->S)

Task Name

1.1.2 - YENI DUVAR YAPIMI

Predecessors

1.1.1 - DUVARLARIN YIKILMASI (E->S)

Successors

1.1.4 - SIVA ISLERI (E->S)
1.1.7 - DUVAR FAYANS KAPLAMASI (E->S)
1.1.10 - IC KAPILARIN YAPILMASI (E->S)

Task Name

1.1.3.1 - DOSEME BETONU 1.BOLUM

Successors

1.1.3.2 - DOSEME BETONU 2.BOLUM (E->S)
1.4.13 - TOPRAKLAMA VE PARATONER (S->S)

Task Name

1.1.3.2 - DOSEME BETONU 2.BOLUM

Predecessors

1.1.3.1 - DOSEME BETONU 1.BOLUM (E->S)

Successors

1.1.3.3 - DOSEME BETONU 3.BOLUM (E->S)

Task Name

1.1.3.3 - DOSEME BETONU 3.BOLUM

Predecessors

1.1.3.2 - DOSEME BETONU 2.BOLUM (E->S)

Successors

1.1.3.4 - DOSEME BETONU 4.BOLUM (E->S)

Task Name

1.1.3.4 - DOSEME BETONU 4.BOLUM

Predecessors

1.1.3.3 - DOSEME BETONU 3.BOLUM (E->S)

Successors

1.1.3.5 - DOSEME BETONU 5.BOLUM (E->S)

Task Name

1.1.3.5 - DOSEME BETONU 5.BOLUM

Predecessors

1.1.3.4 - DOSEME BETONU 4.BOLUM (E->S)

Successors

1.1.6 - KOLON SAC KAPLAMASI (E->S)

Task Name

1.1.4 - SIVA ISLERI

Predecessors

1.1.2 - YENI DUVAR YAPIMI (E->S)

Successors

1.1.5 - IC DUVAR BOYALARI (E->S)

Task Name

1.1.5 - IC DUVAR BOYALARI

Predecessors

1.1.4 - SIVA ISLERI (E->S)

Task Name

1.1.6 - KOLON SAC KAPLAMASI
Predecessors

1.1.3.5 - DOSEME BETONU 5.BOLUM (E->S)

Task Name

1.1.7 - DUVAR FAYANS KAPLAMASI

Predecessors

1.1.2 - YENI DUVAR YAPIMI (E->S)

Task Name

1.1.8.1 - CELIK CATI BOYASI 1.KS

Predecessors

1.1.9.1 - TAVAN BOYASI 1.KISIM (S+10d->S)

Successors

1.1.8.2 - CELIK CATI BOYASI 2.KISIM (E->S)

Task Name

1.1.8.2 - CELIK CATI BOYASI 2.KISIM

Predecessors

1.1.8.1 - CELIK CATI BOYASI 1.KS (E->S)

Successors

1.1.8.3 - CELIK CATI BOYASI 3.KISIM (E->S)
1.4.4 - ALCAK GERILIM KABLOLARI (E->S)

Task Name

1.1.8.3 - CELIK CATI BOYASI 3.KISIM

Predecessors

1.1.8.2 - CELIK CATI BOYASI 2.KISIM (E->S)

Successors

1.1.8.4 - CELIK CATI BOYASI 4.KISIM (E->S)

Task Name

1.1.8.4 - CELIK CATI BOYASI 4.KISIM

Predecessors

1.1.8.3 - CELIK CATI BOYASI 3.KISIM (E->S)

Successors

1.1.8.5 - CELIK CATI BOYASI 5.KISIM (E->S)

Task Name

1.1.8.5 - CELIK CATI BOYASI 5.KISIM

Predecessors

1.1.8.4 - CELIK CATI BOYASI 4.KISIM (E->S)

Successors

1.4.6 - AYDINLATMA TESISATI (E-30d->S)

Task Name

1.1.9.1 - TAVAN BOYASI 1.KISIM

Successors

1.1.8.1 - CELIK CATI BOYASI 1.KS (S+10d->S)
1.1.9.2 - TAVAN BOYASI 2.KISIM (E->S)

Task Name

1.1.9.2 - TAVAN BOYASI 2.KISIM

Predecessors

1.1.9.1 - TAVAN BOYASI 1.KISIM (E->S)

Successors

1.1.9.3 - TAVAN BOYASI 3.KISIM (E->S)

Task Name

1.1.9.3 - TAVAN BOYASI 3.KISIM

Predecessors

1.1.9.2 - TAVAN BOYASI 2.KISIM (E->S)

Successors

1.1.9.4 - TAVAN BOYASI 4.KISIM (E->S)

Task Name

1.1.9.4 - TAVAN BOYASI 4.KISIM

Predecessors

1.1.9.5 - TAVAN BOYASI 5.KISIM (E->S)
1.1.9.3 - TAVAN BOYASI 3.KISIM (E->S)

Task Name

1.1.9.5 - TAVAN BOYASI 5.KISIM

Successors

1.1.9.4 - TAVAN BOYASI 4.KISIM (E->S)

Task Name

1.1.10 - IC KAPILARIN YAPILMASI

Predecessors

1.1.2 - YENI DUVAR YAPIMI (E->S)

Task Name

1.1.11 - DIS SAC KAPILARIN YAPILMASI

Task Name

1.1.12 - AHSAP DOGRAMALARIN DEGISTIRILI

Successors

1.13 - DIS CEPHE BOYASI (E->S)

Task Name

1.13 - DIS CEPHE BOYASI

Predecessors

1.1.12 - AHSAP DOGRAMALARIN DEGISTIRILI (E->S)

Task Name

1.1.14 - CATI TECRIDI TAMIRI

Task Name

1.1.15.1 - 1600 LUK PRES TEMELI YAPIMI

Successors

1.2.1 - 1600 LUK PRES MONTAJI (E->S)
1.1.15.2 - 2200 LUK PRES TEMELININ YAPIMI (S+15d->S)

Task Name

1.1.15.2 - 2200 LUK PRES TEMELININ YAPIMI

Predecessors

1.1.15.1 - 1600 LUK PRES TEMELI YAPIMI (S+15d->S)

Successors

1.2.2 - 2200 LUK PRES MONTAJI (E->S)

Task Name

1.1.15.3 - FIRIN TEMELI
Successors

1.2.3 - ERITME FIRINI MONTAJI (E->S)

Task Name

1.2.0 - MONTAJ ISLERI

Successors

1.9 - ALUMINYUM BITISI (E->S)

Task Name

1.2.1 - 1600 LUK PRES MONTAJI

Predecessors

1.1.15.1 - 1600 LUK PRES TEMELI YAPIMI (E->S)

Successors

1.2.5 - PANO MONTAJI (E->S)

Task Name

1.2.2 - 2200 LUK PRES MONTAJI

Predecessors

1.1.15.2 - 2200 LUK PRES TEMELININ YAPIMI (E->S)

Successors

1.2.5 - PANO MONTAJI (E->S)

Task Name

1.2.3 - ERITME FIRINI MONTAJI

Predecessors

1.1.15.3 - FIRIN TEMELI (E->S)

Task Name

1.2.4 - MEVCUT TEZ.NAKLI

Task Name

1.2.5 - PANO MONTAJI

Predecessors

1.2.2 - 2200 LUK PRES MONTAJI (E->S)
1.2.1 - 1600 LUK PRES MONTAJI (E->S)

Successors

1.2.6 - OTOMASYON MONTAJI (E->S)

Task Name

1.2.6 - OTOMASYON MONTAJI

Predecessors

1.2.5 - PANO MONTAJI (E->S)

Task Name

1.3.0 - MEKANIK ISLER

Task Name

1.3.1 - ISITMA SISTEMI

Successors

1.3.2 - HAVALANDIRMA SISTEMI (S->S)
1.3.3 - SICAK VE SOGUK SU BORULARI (S->S)
1.4.3 - TALI MEK. SISTEM OTOMAZISYONU (E->S)
1.4.7 - MOTOR SALTERLERI (E->S)

Task Name

1.3.2 - HAVALANDIRMA SISTEMI

Predecessors

1.3.1 - ISITMA SISTEMI (S->S)

Successors

1.4.3 - TALI MEK. SISTEM OTOMAZISYONU (E->S)

Task Name

1.3.3 - SICAK VE SOGUK SU BORULARI

Predecessors

1.3.1 - ISITMA SISTEMI (S->S)

Successors

1.3.6 - YANGIN KORUMA (E->S)
1.3.7 - BASINCLI HAVA BORULARI (E->S)
1.3.8 - GAZ BORULARI (E->S)

Task Name

1.3.4 - KANALIZASYON SISTEMI

Task Name

1.3.5 - SIHHI TESISAT

Task Name

1.3.6 - YANGIN KORUMA

Predecessors

1.3.3 - SICAK VE SOGUK SU BORULARI (E->S)

Task Name

1.3.7 - BASINCLI HAVA BORULARI

Predecessors

1.3.3 - SICAK VE SOGUK SU BORULARI (E->S)

Task Name

1.3.8 - GAZ BORULARI

Predecessors

1.3.3 - SICAK VE SOGUK SU BORULARI (E->S)

Task Name

1.4.0 - ELEKTRIK ISLERI

Successors

1.9 - ALUMINYUM BITISI (E->S)

Task Name

1.4.1 - ANA PANOLAR

Successors

1.4.2 - YARDIMCI PANOLAR (S+10d->S)

Task Name

1.4.2 - YARDIMCI PANOLAR

Predecessors

1.4.1 - ANA PANOLAR (S+10d->S)

Successors

1.4.11 - SAAT SISTEMI (E->S)
1.4.3 - TALI MEK. SISTEM OTOMAZISYONU (E->S)
1.4.8 - YANGIN SINYALIZASYON (E->S)
1.4.9 - YANGIN IHBAR (E->S)

Task Name

1.4.3 - TALI MEK. SISTEM OTOMAZISYONU
Predecessors

1.4.2 - YARDIMCI PANOLAR (E->S)
1.3.2 - HAVALANDIRMA SISTEMI (E->S)
1.3.1 - ISITMA SISTEMI (E->S)

Task Name

1.4.4 - ALCAK GERILIM KABLOLARI

Predecessors

1.1.8.2 - CELIK CATI BOYASI 2.KISIM (E->S)

Successors

1.4.5 - KABLO SAIR ISLERI (S->S)

Task Name

1.4.5 - KABLO SAIR ISLERI

Predecessors

1.4.4 - ALCAK GERILIM KABLOLARI (S->S)

Task Name

1.4.6 - AYDINLATMA TESISATI

Predecessors

1.1.8.5 - CELIK CATI BOYASI 5.KISIM (E-30d->S)

Task Name

1.4.7 - MOTOR SALTERLERI

Predecessors

1.3.1 - ISITMA SISTEMI (E->S)

Task Name

1.4.8 - YANGIN SINYALIZASYON
Predecessors

1.4.2 - YARDIMCI PANOLAR (E->S)

Task Name

1.4.9 - YANGIN IHBAR

Predecessors

1.4.2 - YARDIMCI PANOLAR (E->S)

Task Name

1.4.10 - TELEFON SISTEMI

Task Name

1.4.11 - SAAT SISTEMI

Predecessors

1.4.2 - YARDIMCI PANOLAR (E->S)

Successors

1.4.12 - RADYO-SES DUZENI (E->S)

Task Name

1.4.12 - RADYO-SES DUZENI

Predecessors

1.4.11 - SAAT SISTEMI (E->S)

Task Name

1.4.13 - TOPRAKLAMA VE PARATONER

Predecessors

1.1.3.1 - DOSEME BETONU 1.BOLUM (S->S)

Task Name

1.9 - ALUMINYUM BITISI

Predecessors

1.4.0 - ELEKTRIK ISLERI (E->S)
1.2.0 - MONTAJ ISLERI (E->S)

Task Name

2.0 - IDARE BINASI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

2.1 - INSAAT ISLERI

Task Name

2.1.1 - DUVAR YIKILMASI

Successors

2.1.2 - DUVAR BOYASI (E->S)
2.1.5 - SERAMIK KAPLAMALAR (E->S)
2.1.6 - FAYANS ISLERI (E->S)
2.2.2 - VANTILASYON SISTEMI (E->S)

Task Name

2.1.2 - DUVAR BOYASI

Predecessors

2.1.1 - DUVAR YIKILMASI (E->S)

Task Name

2.1.3 - ALU.ASMA TAVANLAR

Task Name

2.1.4 - MARLEY KAPLAMA

Predecessors

2.1.8 - AHSAP KAPILAR (E->S)

Task Name

2.1.5 - SERAMIK KAPLAMALAR

Predecessors

2.1.1 - DUVAR YIKILMASI (E->S)

Task Name

2.1.6 - FAYANS ISLERI

Predecessors

2.1.1 - DUVAR YIKILMASI (E->S)

Task Name

2.1.7 - DIS CEPHE KAPLAMASI

Predecessors

2.1.10 - PENCERELERIN DEGISTIRILMESI (S+30d->S)
2.1.9 - DIS ALU.KAPILAR (E->S)

Task Name

2.1.8 - AHSAP KAPILAR

Successors

2.1.4 - MARLEY KAPLAMA (E->S)

Task Name

2.1.9 - DIS ALU.KAPILAR

Successors

2.1.7 - DIS CEPHE KAPLAMASI (E->S)

Task Name

2.1.10 - PENCERELERIN DEGISTIRILMESI

Successors

2.1.7 - DIS CEPHE KAPLAMASI (S+30d->S)

Task Name

2.2 - MEKANIK ISLER

Task Name

2.2.1 - ISITMA SISTEMI

Successors

2.3.3 - YAR.MEK.SITEM OTOMAZISYONU (E->S)

Task Name

2.2.2 - VANTILASYON SISTEMI

Predecessors

2.1.1 - DUVAR YIKILMASI (E->S)

Successors

2.3.3 - YAR.MEK.SITEM OTOMAZISYONU (E->S)

Task Name

2.2.3 - SU BORULARI

Successors

2.2.6 - YANGIN DOLAPLARI (E->S)

Task Name

2.2.4 - KANALIZASYON

Task Name

2.2.5 - SIHHI TESISAT

Task Name

2.2.6 - YANGIN DOLAPLARI

Predecessors

2.2.3 - SU BORULARI (E->S)

Task Name

2.3 - ELEKTRIK ISLERI

Successors

2.9 - IDARE BIN.BITISI (E->S)

Task Name

2.3.1 - ANA PANOLAR

Successors

2.3.4 - KABLOLAR (S->S)

Task Name

2.3.2 - TALI PANOLAR

Successors

2.3.4 - KABLOLAR (E->E)

Task Name

2.3.3 - YAR.MEK.SITEM OTOMAZISYONU

Predecessors

2.2.2 - VANTILASYON SISTEMI (E->S)
2.2.1 - ISITMA SISTEMI (E->S)

Task Name

2.3.4 - KABLOLAR

Predecessors

2.3.2 - TALI PANOLAR (E->E)
2.3.1 - ANA PANOLAR (S->S)

Successors

2.3.5 - KABLO TEFERRUATI (S->S)
2.3.8 - YANGIN SINYALIZASYONU (S->S)

Task Name

2.3.5 - KABLO TEFERRUATI

Predecessors

2.3.4 - KABLOLAR (S->S)

Task Name

2.3.6 - AYDINLATMA SISTEMI

Task Name

2.3.8 - YANGIN SINYALIZASYONU

Predecessors

2.3.4 - KABLOLAR (S->S)

Successors

2.3.9 - YANGIN IHBAR (S->S)

Task Name

2.3.9 - YANGIN IHBAR

Predecessors

2.3.8 - YANGIN SINYALIZASYONU (S->S)

Task Name

2.3.10 - TELEFON SISTEMI

Successors

2.3.12 - SAAT SISTEMI (S->S)

Task Name

2.3.11 - GUVENLIK SINYALIZASYONU

Task Name

2.3.12 - SAAT SISTEMI

Predecessors

2.3.10 - TELEFON SISTEMI (S->S)

Successors

2.3.13 - RADYO SISTEMI (S->S)

Task Name

2.3.13 - RADYO SISTEMI

Predecessors

2.3.12 - SAAT SISTEMI (S->S)

Task Name

2.3.14 - TOPR. VE PARATONER SISTEMI

Task Name

2.9 - IDARE BIN.BITISI

Predecessors

2.3 - ELEKTRIK ISLERI (E->S)

Task Name

3.0 - KAZAN DAIRESI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

3.1 - INSAAT ISLERI

Successors

3.4 - MONTAJ ISLERI (S+3mo->S)
3.3 - MEKANIK ISLER (S+4mo->S)

Task Name

3.2 - ELEKTRIK ISLERI

Predecessors

3.3 - MEKANIK ISLER (S->S)

Task Name

3.3 - MEKANIK ISLER

Predecessors

3.1 - INSAAT ISLERI (S+4mo->S)

Successors

3.2 - ELEKTRIK ISLERI (S->S)

Task Name

3.4 - MONTAJ ISLERI

Predecessors

3.1 - INSAAT ISLERI (S+3mo->S)

Task Name

5.0 - KOMPRESOR BINASI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

5.1 - INSAAT ISLERI

Successors

5.4 - MONTAJ ISLERI (S+3mo->S)
5.2 - MEKANIK ISLER (S+2mo->S)

Task Name

5.2 - MEKANIK ISLER

Predecessors

5.1 - INSAAT ISLERI (S+2mo->S)

Successors

5.3 - ELEKTRIK ISLERI (S->S)

Task Name

5.3 - ELEKTRIK ISLERI

Predecessors

5.2 - MEKANIK ISLER (S->S)

Task Name

5.4 - MONTAJ ISLERI

Predecessors

5.1 - INSAAT ISLERI (S+3mo->S)

Task Name

6.0 - POMPA ISTASYONU

Successors

50.0 - GECICI KABUL (E->S)

Task Name

6.1 - INSAAT ISLERI

Successors

7.3 - ELEKTRIK ISLERI (S+1mo->S)
6.4 - MONTAJ ISLERI (S+2mo->S)
6.3 - ELEKTRIK ISLERI (S+2mo->S)
6.2 - MEKANIK ISLER (S+2mo->S)

Task Name

6.2 - MEKANIK ISLER

Predecessors

6.1 - INSAAT ISLERI (S+2mo->S)

Task Name

6.3 - ELEKTRIK ISLERI

Predecessors

6.1 - INSAAT ISLERI (S+2mo->S)

Task Name

6.4 - MONTAJ ISLERI

Predecessors

6.1 - INSAAT ISLERI (S+2mo->S)

Task Name

7.0 - GIRIS KAPISI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

7.1 - INSAAT ISLERI

Task Name

7.3 - ELEKTRIK ISLERI

Predecessors

6.1 - INSAAT ISLERI (S+1mo->S)

Task Name

8.0 - KANAL.POMPA IST
Successors

50.0 - GECICI KABUL (E->S)

Task Name

8.1 - INSAAT ISLERI

Successors

8.4 - MONTAJ ISLERI (S+4mo->S)
8.3 - ELEKTRIK ISLERI (S+3mo->S)

Task Name

8.3 - ELEKTRIK ISLERI

Predecessors

8.1 - INSAAT ISLERI (S+3mo->S)

Task Name

8.4 - MONTAJ ISLERI

Predecessors

8.1 - INSAAT ISLERI (S+4mo->S)

Task Name

10.0 - YAGMUR SUYU TANKI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

10.1 - INSAAT ISLERI

Successors

10.4 - MONTAJ ISLERI (S+3mo->S)
10.3 - ELEKTRIK ISLERI (S+3mo->S)

Task Name

10.3 - ELEKTRIK ISLERI

Predecessors

10.1 - INSAAT ISLERI (S+3mo->S)

Task Name

10.4 - MONTAJ ISLERI

Predecessors

10.1 - INSAAT ISLERI (S+3mo->S)

Task Name

9.0 - SAHA KANALIZASYON

Successors

50.0 - GECICI KABUL (E->S)

Task Name

9.1 - INSAAT ISLERI

Successors

9.2 - MEKANIK ISLER (S->S)

Task Name

9.2 - MEKANIK ISLER

Predecessors

9.1 - INSAAT ISLERI (S->S)

Task Name

11.0 - SICAK SU SEBEKES

Successors

50.0 - GECICI KABUL (E->S)

Task Name

11.1 - INSAAT ISLERI

Successors

11.2 - MEKANIK ISLER (S->S)

Task Name

11.2 - MEKANIK ISLER

Predecessors

11.1 - INSAAT ISLERI (S->S)

Task Name

12.0 - YAGM.SU ARITMA

Successors

50.0 - GECICI KABUL (E->S)

Task Name

12.1 - INSAAT ISLERI

Successors

12.4 - MONTAJ ISLERI (S+2mo->S)

Task Name

12.4 - MONTAJ ISLERI

Predecessors

12.1 - INSAAT ISLERI (S+2mo->S)

Task Name

14.0 - SAH.YAG.SUYU TOPLAMA

Successors

50.0 - GECICI KABUL (E->S)

Task Name

14.1 - INSAAT ISLERI

Successors

14.2 - MEKANIK ISLER (S->S)

Task Name

14.2 - MEKANIK ISLER

Predecessors

14.1 - INSAAT ISLERI (S->S)

Task Name

15.0 - GAZ VE BA.HAVA SEBEKESI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

15.1 - INSAAT ISLERI

Successors

15.2 - MEKANIK ISLER (S->S)

Task Name

15.2 - MEKANIK ISLER

Predecessors

15.1 - INSAAT ISLERI (S->S)

Task Name

16.0 - SAHA 1 KV ELEKTRIKI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

16.1 - INSAAT ISLERI

Successors

16.3 - ELEKTRIK ISLERI (S->S)

Task Name

16.3 - ELEKTRIK ISLERI

Predecessors

16.1 - INSAAT ISLERI (S->S)

Task Name

17.0 - SAHA 10 KV DAGITIM

Successors

50.0 - GECICI KABUL (E->S)

Task Name

17.1 - INSAAT ISLERI

Successors

19.3 - ELEKTRIK ISLERI (S+1mo->S)
17.3 - ELEKTRIK ISLERI (S->S)

Task Name

17.3 - ELEKTRIK ISLERI

Predecessors

17.1 - INSAAT ISLERI (S->S)

Task Name

18.0 - SAHA YOLLARI

Task Name

18.1 - INSAAT ISLERI

Task Name

19.0 - CEVRE DUVARI

Successors

50.0 - GECICI KABUL (E->S)

Task Name

19.1 - INSAAT ISLERI

Task Name

19.3 - ELEKTRIK ISLERI

Predecessors

17.1 - INSAAT ISLERI (S+1mo->S)

Task Name

20.0 - SAHA DISI ISLER

Successors

50.0 - GECICI KABUL (E->S)

Task Name

20.1 - DIS YOLLAR

Task Name

20.3 - 10 KV.KABLO DOSENMESI

Task Name

50.0 - GECICI KABUL

Predecessors

20.0 - SAHA DISI ISLER (E->S)
19.0 - CEVRE DUVARI (E->S)
17.0 - SAHA 10 KV DAGITIM (E->S)
16.0 - SAHA 1 KV ELEKTRIKI (E->S)
15.0 - GAZ VE BA.HAVA SEBEKESI (E->S)
14.0 - SAH.YAG.SUYU TOPLAMA (E->S)
12.0 - YAGM.SU ARITMA (E->S)
11.0 - SICAK SU SEBEKES (E->S)
9.0 - SAHA KANALIZASYON (E->S)
10.0 - YAGMUR SUYU TANKI (E->S)
8.0 - KANAL.POMPA IST (E->S)
7.0 - GIRIS KAPISI (E->S)
6.0 - POMPA ISTASYONU (E->S)
5.0 - KOMPRESOR BINASI (E->S)
3.0 - KAZAN DAIRESI (E->S)
2.0 - IDARE BINASI (E->S)
1.00 - ALUMINYUM EKZTRUZYON (E->S)

Task Name

- ISIN BITISI

Predecessors

0.00 - 1.SAHA ISLERI (E->S)
