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- A. Date - Monday, December 21, 1992
 - B. Location - RJS office - Mt. Pleasant, Michigan
 - C. Those attending
 - 1. Roy Gies - Start up manager - MSU
 - 2. Ralph J. Stephenson - Consultant
 - D. Agenda
 - 1. Review assumptions on dfi contract management
 - 2. Review processing of turnover packages
 - 3. Monitor current status of project from 30 day lookahead of A/C.
 - 4. ✓Update master mechanical data base from A/C for msu pp4
 - 5. ✓Review roles of major contractors in start up
 - 6. ✓Review A/C contract dates & their relation to dfi & start up work
 - 7. ✓Review comments on start up network models
 - E. Roles of major contractors in start up
 - 1. A/C
 - a) According to the latest information will provide all dfi startup packages to Jim Simons of MSU.
 - F. Comments on start up network models
 - 1. No additional comments.

8:00 AM - Tuesday, December 15, 1992

- A. Location - MSU east conference room at physical plant
- B. Those attending
 - 1. Dave Monroe - Alberici/Clark
 - 2. John J. Hucul - Alberici/Clark
 - 3. Dick Wever - MSU construction
 - 4. Jim Simons - MSU construction
 - 5. Roy Gies - MSU utilities - start up manager
 - 6. Ralph J. Stephenson - consultant
- C. Agenda
 - 1. Discuss dsc start up
 - 2. Evaluate current start up planning
- D. Notes from meeting with full group
 - 1. General
 - a) rgi went over the dsc sequencing process.
 - b) dmo said we need to get the parties together to discuss how all are going to interface on the start up work.
 - c) jhu feels when they turn over a system there is a reasonably straight path through to the actual start up.
 - d) rgi asked about the accuracy of the 30 day look ahead and the turnover dates.
 - e) dmo gave rgi copy of master mech start up material dated September 30, 1992.
 - f) January 22, 1992 date mentioned by dmo for what ?
 - g) Told jhu he could review the notes I am taking if he wishes.
 - 2. Reviewed Quality Electric's role in the start up process.
 - a) dmo doesn't see qel doing any technical support in start up.
 - 3. Steam generator
 - a) jhu says tam appears to be behind in their construction work.
 - b) rgi says tam is in good shape on writing logic for the control system.
 - c) dmo and jhu said that tam must give msu start up plan of action.
 - d) Steam blow definition as discussed at meeting
Construction steam blow is when you move live steam through the main steam and temporary steam blow lines, shoot the target (highly polished target to move steam past, and check disfigurement of surface) until the turbine manufacturer says ok.
 - e) General agreement that the start up of the steam generator by tam is partially shown on sheet sg1.
 - f) A/C says responsibility for bringing tam on line relative to start up is msu's. Is this true?
 - g) What is the breakdown of msu and tam's work on the startup process?

- h) What is A/C's role in tam's work?
- i) Need to go over the startup network and determine what is tam's work and what is msu's.
- 4. **Mechanical systems on line date check list**
 - a) dmo wants dates when rgi needs the various systems from dmo.
 - b) dmo repeated he needs a list of when tam wants various mechanical systems complete and installed.
- 5. **Controls and dcs**
 - a) Reviewed installation of the dcs work. rgi will discuss this with rmc and how the dcs system, msu and qel relate to each other.
 - b) rgi is concerned about the abilities of various organizations involved in construction and startup to effectively install the dcs electrical construction work.
 - c) rmc is available and will provide help in dcs and control work wherever it is required.
- E. **Notes from meeting with rgi and jsi - 10:40:35 AM**
 - 1. **Monitor boiler installation.**
 - a) jsi, rgi and rjs reviewed steam generator status and color coded network.
 - 2. **Need to identify responsibility codes for boiler start up on #sg1.**
 - 3. **Discussed position of construction steam blow out in startup planning.**

IX. Printing file

1. Location - MSU facilities office conference room

2. Those attending

- a) Roy Gies - Start up manager - MSU
- b) Dick Wever - Construction superintendent - MSU - in meeting part time
- c) Ralph J. Stephenson - Consultant

1. Location - rjs office - Mt. Pleasant, Michigan

2. Those attending

- a) Roy Gies - Start up manager - MSU
- b) Ralph J. Stephenson - Consultant

1. Location - rjs office - Mt. Pleasant, Michigan

2. Those attending

- a) Roy Gies - Start up manager - MSU
- b) Ralph J. Stephenson - Consultant

1. Network models issued to those attending and in effect are as follows :

- a) Steam Generator Start Up - sht #sg1, issue #5, dated 11/04/92 (wd 472)
- b) Turbine Generator Start Up - sht #tg1, issue #5, dated 11/04/92 (wd 472)
- c) Turbine Generator Start Up - sht #tg2, issue #5, dated 11/04/92 (wd 472)
- d) Heat Rejection System Start Up - sht #hr1, issue #5, dated 11/05/92 (wd 473)
- e) Summary Start Up - sht #sm1 - issue #5, dated 11/05/92 (wd 473)

2. Translations issue to those attending include:

- a) Bar chart of the network models issued, except sm1.

3. Those attending

- a) Dave Monroe - Alberici/Clark
- b) John J. Hucul - Alberici/Clark
- c) Pete Theis - Tampella
- d) Dick Wever - MSU construction
- e) Charles Griffin - Environmental Elements
- f) Pete Sternisha - General Electric
- g) Jim Simons - MSU construction
- h) Phil Dimitry - Black & Veatch
- i) Ron McClintic - MSU utilities
- j) Doug MacDonald - MSU utilities
- k) Roy Gies - MSU utilities - start up manager
- l) Ralph J. Stephenson - consultant

4. General notes

- a) Set Friday, November 13, 1992 pm (wd 480) as date by which comments on the start up plans issued were to be returned to Roy Gies.
- b) Established positions of Roy Gies, Jim Simons, and John Hucul relative to the information flow.
- c) Copy of Roy Gies notes - by his permission - as written
 - (1) Monroe - Turnover card
 - (a) Summary of package
 - (2) Ralph
 - (a) Discussion of package
 - (b) Discussion of procedure of turnover
 - (c) Jim in charge construction MSU

MSU PP4 start up meeting notes

- (d) John H. in charge of general constructor
- (e) Roy in charge of start up
 - i) Reporting to R. Ellerhorst
- (f) Using Hucul's electrical equipment list
 - i) Evolving list of all equipment using B&V system descriptions
- (g) All general systems designated by X at end of three letter description
- (h) Brief descriptions of CEM, COX, HRX, TGX 1 & 2, SGX
- (i) *Copy available of all codes available
- (j) Please avoid today, discussion on dates - all work uses contract dates.
- (k) Roy - Presentation of system
- (l) Ralph - Presentation of bar graph - explanation of bar graph
- (m) Wever/Monroe - Concern on actual dates - who provides info? - much discussion on dates
- (n) Monroe - High priority to establish "dates"
- (o) Ralph/Roy
 - i) Complete CEM
 - ii) Complete COX
 - iii) Complete baghouse
 - iv) Roy & Pete complete SGX start up - Roy, J.H., Pete
 - (1) Give all data to DMD (what does this mean?)
 - v) Roy + EEL
 - vi) Roy + TDY
- (p) Comments from attendees by Friday, November 13, 1992 - send direct to Roy Gies. He will?

1. Location - MSU facilities office conference room

2. Network models in effect are as follows :

- a) Steam Generator Start Up - sht #sg1, issue #5, dated 11/04/92 (wd 472)
- b) Turbine Generator Start Up - sht #tg1, issue #5, dated 11/04/92 (wd 472)
- c) Turbine Generator Start Up - sht #tg2, issue #5, dated 11/04/92 (wd 472)
- d) Heat Rejection System Start Up - sht #hr1, issue #5, dated 11/05/92 (wd 473)
- e) Summary Start Up - sht #sm1 - issue #5, dated 11/05/92 (wd 473)
- f) Translations issued
 - (1) Bar chart of the network models issued, except sm1.

3. Those attending

- a) Roy Gies - Start up manager - MSU
- b) Ron McClintic - Technical Supervisor - MSU - in late am & pm
- c) Ralph J. Stephenson - Consultant

4. Agenda for Wednesday, November 11, 1992

- a) Hold preliminary discussions with Ron McClintic re cox/cem/denox.
- b) Discuss meeting with Ron McClintic on Monday, November 23, 1992 at Mt. Pleasant.
Topic - DCS start up
- c) Diagram cox startup.
- d) Diagram cem/denox startup.
In order to start up the coal, limestone firing the cem must be commissioned and running. The denox system needs to be commissioned & in an operable state.
- e) Set procedures for future monitoring & meetings.
 - (1) Controls
 - (2) Continuous emissions monitoring
 - (3) Reviews and approvals on start up plans
 - (4) Input from A/C (bldgs systems & mech), GEL, TAM, EEL, TDY, QEL,

MSU PP4 start up meeting notes

- f) Diagram fabric filter startup.
 - g) Training - review and discuss inclusion in networks.
 - h) Discuss including IMC's network installation items in the master equipment list.
 - i) ✓Discuss letter from Tampella.
 - j) ✓Discuss meeting with Tampella.
 - k) ✓Validate dates in a/c master mechanical data base.
- 5. Initial meeting of Roy Gies with Tampella on November 10, 1992**
- a) Those attending
 - (1) Dan Hurley - Project manager - Tampella
 - (2) Pete Theis - Senior field engineer - Tampella
 - (3) Roy Gies - Start up manager - MSU
 - b) General notes - by rjs from discussion with Roy Gies
 - (1) Reviewed start up letter from Tampella to A/C dated 10/15/92
 - (2) May skip air envelope test (SG062) exercising dye penetrant testing option (who authorized this change?)
 - (3) Made preliminary logic shifts, additions & deletions - will defer updating until full critique is provided by Tampella. Due on pm Friday, November 13, 1992
- 6. Start up letter from Tampella**
- a) Sent from Dan Hurley to John Hucul - cc to Pete Theis & Paul Bianchet
 - b) Jim Simons had copy from someone & may have sent to Doug MacDonald
 - c) Contains valuable info about
 - (1) Milestones
 - (2) Equipment requirements
 - (3) Timing of start up sequence
 - (4) Duration of start up sequence
 - (5) Start up items or events by others than TPC
 - (6) Preliminary operations information
 - (7) Training
- 7. Color codes for systems**
- a) Blue - tgx - Turbine Generator System
 - b) Green - ccx - Combustion Cleaning System
 - c) Orange - sgx - Steam Generation System
 - d) Pink - cem/denox - Continuous Emissions Monitoring
 - e) Purple - dcs - Distributed Control System
 - f) Unmarked - bsx - Building & Structure Systems
 - (1) Circled in red on A/C mechanical start up list
 - g) Yellow - hrx - Heat Rejection System
- 8. Meeting agenda for dcs planning discussion.**
- a) Date of meeting - November 23, 1992
 - b) Subjects to cover
 - (1) Prepare laundry lists of activities for each subject
 - (2) dcs systems planning
 - (3) cem systems planning
 - (4) Software & hardware design status
 - (5) Training requirements
 - (6) Bailey work progress evaluation
 - (a) Status of design
 - (b) Status of approvals
 - (c) Status of fabrication
 - (d) Status of installation
 - (7) Begin preparing start up check list - need field additions.

MSU PP4 start up meeting notes

9. Example of random laundry list preparation

- a) Fabric Filter Building
 - (1) T/R to beginning of start up - am 05/03/93 - clear gas path
 - (2) Power up DCS control system for CCX
 - (3) Power up MCC 42
 - (4) Power up MCC 41
- b) What has to be complete to start up?
 - (1) Instrumentation complete & checked
 - (2) Supply air system complete & checked
 - (3) Bag house control configuration complete & checked
 - (4) Logic

10. Definitions

- a) Configuration
- b) Logic
- c) Start up
 - Begins when the start up manager (Roy Gies) receives the initial turnover card and packet from
- d) Commissioned
 - Equipment has been installed, connected, tested, calibrated, run in, and certified if required.
- e) Turnover packet
- f) Turnover card
- g) NOX
- h) Denox system
 - A urea injection into the flue gas to drop out
- i) CEM - Continuous emissions monitoring system
 - Several systems (opacity, nox, etc.) combined into a single system to measure & analyze flue gas emissions into the atmosphere at the stack outlet.

1. Location - RJS office

2. Those attending

- a) Ron McClintic - Technical Supervisor - MSU - in late am & pm
- b) Ralph J. Stephenson - Consultant

3. Agenda for Monday, November 23, 1992

- a) Review roles of Roy Gies & Ron McClintic in start up
 - (1) In relation to responsibility
 - (2) In relation to authority
 - (3) In relation to MSU construction department
 - (a) Jim Simons
 - (b) Dick Wever
 - (4) In relation to MSU utilities department
 - (a) Rick Johnson - electrical interfacing in respect to
 - i) Control Power Corporation
 - ii) Between existing and PP4
 - (5) In relation to dfi contractors
 - (a) Field operations assigned to Alberici Clark
 - i) Tampella
 - ii) General Electric
 - iii) Environmental Elements
 - iv) Thermal Dynamics

MSU PP4 start up meeting notes

- (b) Under direct owner control - Rick Johnson
 - i) Bailey Controls
 - ii) Control Power Corporation - high voltage equipment
- (6) In relation to non dfi primes
 - (a) Alberici Clark
 - i) IMC Mechanical
 - (b) Quality Electric
- b) Identify methods of documenting start up classifications so the information is of max value in plant operations.
 - (1) Black & Veatch designated
 - (2) dcs systems
 - (3) dfi overarching systems
- c) Review how we integrate the plant wide control installation, its start up, and its turn over for full operation.
- d) Prepare preliminary Bailey control network models to set interfaces with main systems.

These may best be shown by adding the control activity interface into each major system network directly.

 - (1) Controls - cox & dcs
 - (2) Heat rejection system - hrx
 - (3) Combustion gas cleaning & exhaust (bag house) - ccx & cem
 - (4) Steam generator - sgx

May attempt to run generator from existing steam sources - boilers 1, 2 & 3.

 - (a) Water controls
 - (b) Combustion controls
 - (c) Burner management controls
 - (d) Steam conditioning controls
 - (e) Other?
- (5) Turbine & generator - tgx

III. 8:46:25 AM - September 11, 1992

A. Agenda

1. Define start up
2. Continue listing systems as a part of the start up

B. Those attending

1. Bob Ellerhorst - Utility director
2. Roy Gies - Operations supervisor
3. Dave Munroe - A/C
4. John Hucul - A/C
5. Rick Johnson -
6. Ralph J. Stephenson - Consultant

C. General notes

1. Dave Munroe described how A/C wants to turn over the system.
2. Decisions - preliminary for final review
 - a) A/C wants to turn over each system as completely as possible to the utility group.
 - b) Decision was made that A/C will work with Roy Gies as the single point contact representative with MSU.
 - c) Definition of start up

- (1) Draft #2

Start up is the period from where construction of a system is considered complete through to commercial operation of the plant by the am of 09/07/93. The startup period for a system ~~is the point in time where the start up manager receives the initial turnover card.~~

- (a) Turnover card is prepared by A/C
Represents that construction of a designated system is complete in accordance with A/C understanding of the contract scope. The turnover card when completed is signed off on by A/C, its subs, and the MSU construction staff.
- (b) The turnover card is sent to Roy Gies who is the official startup manager for MSU.
Roy Gies formally acknowledges by his signature that he has received the completed turnover card, and that he is taking over the responsibility for MSU work in starting up the system.
- (c) As the turnover proceeds the turnover card provides a vehicle by which responsibility for required corrections, adjustment, and other changes that may be required can be transferred to and from A/C from and to MSU.
- (d) When the turnover card no longer returns to A/C the system is considered accepted by the MSU startup team for their work.

3. Systems

- a) Plant system start up - major category of start up work
 - (1) Cooling tower system start up
 - (a) Mechanical construction items
 - i) hrc
 - ii) hre -
 - iii) Chemical feed
 - iv) etc.

- (b) Electrical construction items
 - (2) Control system start up
 - (3) Turbine system start up
 - (4) Boiler system start up
 - (5) Bag house system start up
- 4. **Process of planning start up actions**
 - a) Identify systems
 - b) Establish dependencies
 - c) Set priorities
 - d) Establish the time frame.
- 5. **Plant system start up - major category of start up work - starts at completion of construction & turnover to MSU. (turnover card transmitted to Roy Gies). THESE ARE FOR REVIEW & COMMENT ONLY!**
 - a) Control system start up (1)
 - (1) Bailey systems software
 - b) Cooling tower system start up (2)
 - (1) Mechanical construction systems
 - (a) wsc - raw water system - make up water to hrc system
 - (b) hrc - circulating water systems
 - (c) fpu - fire protection system
 - (d) hre - chemical feed systems
 - (e) cab - instrument air system
 - (f) cab - control air system
 - (g) etc.
 - (2) Electrical construction systems
 - (a) High voltage system
 - (b) Low voltage system
 - (c) Control system
 - (3) dcs systems
 - (a) Software system
 - (4) Calgon system
 - c) Turbine system start up (3)
 - (1) Mechanical construction systems
 - (a) sgg - main steam system
 - (b) tea - extraction steam
 - (c) hrc - circulating water system
 - (d) hra - condensate systems
 - (e) cab - instrument air system
 - (f) ecb - closed cooling water system
 - (g) cab - control air system
 - (2) Electrical construction systems
 - (a) High voltage system
 - (b) Low voltage system
 - (c) Control system
 - (d) Relaying system- multilin electrical relaying system
 - (e) etc.
 - (3) dcs systems
 - (4) General Electric systems
 - (a) Turbine systems

- i) Lube oil system
 - ii) Control oil system
- (b) Generator systems
- (c) etc.
- d) Boiler system start up (4)
 - (1) Mechanical construction systems
 - (a) ecb - closed cooling water system
 - (b) cab - control air system
- e) Bag house system start up (5)
 - (1) Mechanical construction systems
 - (a) cab - instrument air system
 - (b) asg - ash collection
 - (c) ecb - closed cooling loop system
 - (d) cab - control air system
 - (2) Electrical construction systems
 - (3) dcs systems
 - (4) Environmental Elements systems
- f) Continuous emissions monitoring system (6)
 - (1) Environmental Elements systems
 - (2) Mechanical construction systems
 - (a) cab - control air system
 - (3) Electrical construction systems

msu pp#4 - msu pp#4 notes - d326

I. 8:31:41 AM - August 24, 1992

A. Agenda

1. Review bag house network with Gary Phillips and David Sanger
2. Complete & issue bag house network issue #6
3. Inspect project
4. Initiate discussions re plant start up with MSU staff

B. Bag house meeting and job inspection - am

1. Those attending
 - a) David Sanger - MSU field inspector
 - b) Gary Phillips - Environmental Elements field construction superintendent
 - c) Ralph J. Stephenson - Consultant

C. Start up conference - pm

1. Those attending
 - a) Jim Simons - Field representative
 - b) Bob Ellerhorst - Utility director
 - c) Doug MacDonald - Mechanical engineer
 - d) Roy Gies - Operations supervisor
 - e) Ralph J. Stephenson - Consultant
2. Agenda
 - a) Who is in charge? Who will spearhead the effort?
 - b) Discuss laundry list - nature, content and method of preparation
 - c) Discuss training
3. Questions and random comments
 - a) Are we including the curing refractory and chemical cleaning in the start up?
 - (1) What fuel and heat will be used for start up operations?
 - (2) Jim indicated we must decide where the curing heat is to come from.
 - (3) Cannot use natural gas in boiler without sand.
 - b) Must circulate sand to avoid impingement on the opposite wall.
 - c) When, where and how should Tampella be involved?
 - d) Set pattern for next meeting
4. Organization
 - a) Mr. Roy Gies was appointed the Start Up Manager
Mr. Gies will be responsible for, and have the authority to make, most management decisions concerning start up. He will also have the MSU construction, design, general construction, and dfi (design, fabricate and install) group from which to draw technical help as needed.
 - b) Discussed organizational structure of start up operations

II. 8:50:42 AM - August 31, 1992

A. Phone call to Purdue University re start up

1. Those involved
 - a) Wayne Kjonaas - Director of Utilities - Purdue University
 - b) Bob Ellerhorst - Director of Utilities - Michigan State University
 - c) Dick Wever - Construction Superintendent - Michigan State University
 - d) Don Clendenan - Shift first engineer - Michigan State University
 - e) Ralph J. Stephenson - Consultant
2. Notes
 - a) Start up staff
 - (1) Design team

- (2) Owner team
- b) Method of starting up
 - (1) Organization of start up team
 - (a) Selected university staff member for start up coordinator
 - (b) Initially used a combination of the design team and university operators to manage the start up work.
 - (c) Found it best to tie start to and with the actual plant operation
 - (d) Start up responsibility and authority were gradually shifted to the start up coordinator.
 - (e) The pco was actually in charge of starting up the systems
 - (2) How start up team solved problems
 - (a) Tried to identify current and future problems early so as to anticipate the difficulties they might cause.
 - i) Engineering problems
 - ii) Construction problems
 - (b) Attempted to resolve problems before they adversely affected the start up process.
 - (c) pco went back to the construction project manager and the design team for technical help in solving problems.
- c) Performance testing
 - (1) How to determine if and when the boiler unit is performing?
 - (a) pco was in charge
 - (b) Foster Wheeler had engineers on site to help the pco
 - (c) Other engineers helped the pco
 - (2) Engineers assigned to each system
 - (a) Utility engineering was responsible for all systems (?)
- d) Systems - preliminary list given on phone without reference to faxed list below
If a system had its own start up it was included as a unit system in the start up
 - (1) Limestone system
 - (2) Ash system
 - (3) Compressed air system
 - (4) Material handling system
 - (5) Boiler feed water pumps
 - (6) Steam systems
 - (a) Broken down by pressures
 - (7) Other? - Mr. Kjonaas will fax Bob full list of systems Purdue used in starting up.
- e) Major categories of start up work
 - (1) Mr. Kjonaas faxed Bob Ellerhorst list of categories - the list sent on 08/31/92 included the following for the Purdue power plant
 - (a) Dodge - lead engineer
 - i) Boiler feedwater
 - ii) 15# steam piping
 - iii) Elevator
 - (b) Dwyer - lead engineer
 - i) 650# steam piping
 - ii) Coal handling
 - iii) Emissions monitoring
 - iv) Compressed air and gas

- (c) Miller - lead engineer
 - i) Distributed control
 - ii) Building lighting
 - iii) Building communications
- (d) Nethercutt/Dwyer - lead engineers
 - i) Boiler
- (e) Nethercutt - lead engineer
 - i) Combustion air
 - ii) Flue gas
- (f) Porte - lead engineer
 - i) Electrical power systems
- (g) Rafacz - lead engineer
 - i) Limestone handling
 - ii) Condensate and demineralized water
 - iii) 125# steam piping
 - iv) Fire protection bldg and ct
- (h) Rodgers - lead engineer
 - i) Process water and steam sampling
 - ii) Ash and inerts handling
 - iii) Building heating and ventilation
 - iv) Blowdown
- f) Start up definition

Any time a system had to be started it was a part of start up. Boiler start up & sand is a good example.

On simple systems start up began as far along as after 95% construction complete.

On complex systems such as the bag house, the pre startup was Foster Wheeler's work until the university began to be involved.

When a university employee started an actual operational action, this was considered to be the beginning of the start up operation. Purdue supplied all labor for operational activities.

- g) Regulatory involvement
 - (1) Indiana Department of Environmental Protection was major state agency.
 - (2) University staff kept in close touch with the Indiana Department of Environmental Protection.
 - (a) During start up operations kept in constant communication with the DEP
 - (3) Unsupported 1st coal firing triggered permit requirement considerations.
 - (4) Refractory cure out - used gas burners for curing - not considered to be a firing
 - (5) CEM's operable at first firing
- h) Miscellaneous
 - (1) University added coal crusher just ahead of silo - everything is crushed to 3/4" or smaller going into the silo..
- i) Turbine project at Purdue
 - (1) Will probably start in early 1993

B. Meeting notes

- 1. Those attending
 - a) Bob Ellerhorst - MSU director of utilities

- b) Dick Wever - MSU construction superintendent
- c) Don Clendenan - Shift first engineer
- d) Ralph J. Stephenson - Consultant
- 2. Agenda
 - a) Decide on key players and what they are going to do
 - b) Set approach to planning start up
- 3. Key players - during start up
 - a) Roy Gies - Operations supervisor & start up manager
Responsible for and has the authority to make decisions re start up. He will have technical help available from the MSU construction, design, general construction, and design, fabricate and install contractors as may be needed and related to start up.
 - b) Shift first engineers
Will be involved as start up events occur on their shift, or as special start up assignments appear to which they can contribute special skills.
 - (1) Don Clendenan - Shift first engineer
 - (2) Gil Davis - Shift first engineer
 - (3) Bob Lee - Shift first engineer
 - (4) Jack Hubbard - Shift first engineer
 - (5)
 - c) Doug MacDonald - Mechanical engineer
Provides technical liaison between design, construction & start up of power plant #4. Also responsible, with Bob Ellerhorst, for procurement and quality assurance of fuel, stone & sand needed for start up.
 - d) Rick Johnson - Electrical engineer
Responsible for technical electrical liaison between design, construction, and start up in conjunction with Bob Ellerhorst and Jim Simons.
 - e) Black & Veatch - Architect engineer of record
Duties in start up are as defined by contract.
 - f) Others to be defined
 - (1) Dick Wever
 - (2) Jim Simons
 - (3) Bob Nestle
- 4. Definitions
 - a) Start up
The work leading to commercial operation by the am of 09/07/93, which is triggered by the a university staff member in starting an actual operational action on a major start up system.

(This definition is to be refined)
 - b) Others to be added as the start up is planned
- 5. Laundry lists
 - a) To be defined within the major system classes
- 6. Main system classes
 - a) Control system start up
 - b) Plant start up
 - c) Turbine start up
 - d) Boiler start up

8/15/92

msu pp #4 elect const laundry list

disk # 323 1
MSU PP#4 ELECT

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
1	1.000	Ground cable tray				que		
2	2.000	Install cable tray				que		
3	3.000	Install instrument conduit to junction boxes				que		
4	4.000	Pull instrument wire from ? to ?				que		
5	5.000	Make instrument wiring final connections				que		
6	6.000	Install isolated instrument grounding				que		
7	7.000	Install lighting conduit from ? to ?				que		
8	8.000	Install 110 V power conduit from ? to ?				que		
9	9.000	Install lighting panels				que		
10	10.000	Pull lighting wire from ? to ?				que		
11	11.000	Pull 110 v power wire from ? to ?				que		
12	12.000	Make final 110 v power connections				que		
13	13.000	Install light fixtures				que		
14	14.000	Install Unistrut support system				que		
15	15.000	Install equipment power conduit				que		
16	16.000	Pull equipment wire				que		
17	17.000	Make final equipment power connections				que		

in oen listing

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
18	18.000	Prepare & submit bus duct location drawings				msu/bai		
19	19.000	a/e review & approve bus duct location drawings				b&v		
20	20.000	dafd (Detail, approve, fab & deliver) mcc's 41 & 42				msu/wes/bai/b&v	8/28/92	
21	21.000	dafd dcs cabinets 428 & 429				msu/bai/b&v		
22	22.000	dafd 13.8 kv distribution switch gear				msu/cpc7/b&v		
23	23.000	dafd mcc's 43 & 44 with dcs (distributed control system?) cabinets 431 & 432)				msu/wes/bai/b&v/	8/28/92	
24	24.000	dafd mcc's 45 & 46 with dcs (distributed control system) cabinets 411 & 412				msu/wes/bai/b&v	8/28/92	
25	25.000	dafd free standing dcs cabinets				msu/bai/b&v		
26	26.000	dafd 4160 v substation (transformers ?)				msu/wes/b&v		x
27	27.000	dafd 480 v substation (transformers ?)				msu/wes/b&v /		x
28	28.000	dafd ess 2-4 batteries				msu		x
29	29.000	dafd mcc 47				msu/	8/28/92	
30	30.000	dafd mcc 48				msu/wes/b&v	8/28/92	
31	31.000	dafd ess distribution panel				msu		
32	32.000	dafd ess ac power panels				que		
33	33.000	dafd ess inverter				msu		
34	34.000	dafd ess dc power panels				que		

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
35	35.000	da/d ess battery chargers (3)				msu/		x
36	36.000	Set mcc's 41 & 42	851' 0" - col line E12	4APC-M CC-42		que/		
37	37.000	Set dcs cabinets 428 & 429				msu/b ai/b & v		
38	38.000	Set 13.8 kv distribution switch gear				msu/c pc?/b & v		X
39	39.000	Set mcc's 43 & 44 with dcs (distributed control system?) cabinets 431 & 432)	875' 0" col line - E14			que/	8/28/92	X
40	40.000	Set mcc's 45 & 46 with dcs (distributed control system) cabinets 411 & 412	875' 0" - col line B11			que/	8/28/92	
41	41.000	Set free standing dcs cabinets				msu/b ai/b & v		
42	42.000	Set 4160 v substation (transformers ?)				msu/w es/b & v		x
43	43.000	Set 480 v substation (transformers ?)	861' 4 1/2" - col line K12			que/		x
44	44.000	Set ess 2-4 batteries				msu		x
45	45.000	Set mcc 47	COOLING TOWER			que/	8/28/92	
46	46.000	Set mcc 48	Cooling tower			que/	8/28/92	
47	47.000	Set ess distribution panel				msu que		X
48	48.000	Set ess ac power panels				que		X
49	49.000	Set ess inverter				msu que		X
50	50.000	Set ess dc power panels				que		
51	51.000	Set ess battery chargers (3)	890' 0" - col line K12			que/		x

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
52	52.000	da/d alternate source transformer				msu		
53	53.000	Set alternate source transformer				que		
54	54.000	da/d lighting switchgear substation				que/b & v/		
55	55.000	Set lighting switchgear				que		
56	56.000	da/d lighting panels				que		
57	57.000	Pull main feed from cable vault to chemical electrical building				que		
58	58.000	Pull main feed to cooling tower				que		
59	59.000	Pull main feed in pp #4 from n end cable vault to s end pull box				que		
60	60.000	Make final connections (mfc) to equipment as noted in 60.000 series from 4160 substation 41			4160 substation 41			
61	60.001	mfc to 1A equipment spare X			4160 substation 41			
62	60.002	mfc to 2A b/w pump 1A / 4FWA-P-1A	851'0" - col line D11	4FWAE P-1A 100501	4160 substation 41A	abc/ta m?		
63	60.003	mfc to 3A id fan 1A 4CCB-FAN-1A	877'0" - col line AA12	4CCBE AN-1A 100501	4160 substation 41A	abc/ta m?		
64	60.004	mfc to 4A pt (potential transformers) compt		—	4160 substation 41A			
65	60.005	mfc to 5A pt (potential transformers) compt		—	4160 substation 41B			
66	60.006	mfc to 6A id (induced draft) fan 1B 4CCB-FAN-1B	877'0" - col line AA14	4CCBE AN-1B 100502	4160 substation 41B	abc/ta m?		
67	60.007	mfc to 7A trans compt CT (CURRENT TRANS)		—	4160 substation 41A			
68	60.008	mfc to b/w pump 1B 45GA-P-1B	851'0" - col line D11	4FWAE P-1B 100502	4160 substation 41B	abc/ta m		

60.0?? ATTEMPERATOR SPRAY PUMP
4FWG-P-1B

60.0?? 11 11 11 in oen listing
4FWG-P-1A

4FWGE 4160 V
100502 SUB
41B
4FWGE 4160V
100501 SUB
41A

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
69	60.009	mfc to SA equipment spare DON'T NEED * NO CONNECTION TO BE MADE		—	4160 substation 41			
70	60.010	mfc to SA spare *		—	4160 substation 41			
71	60.011	mfc to SA pa fan 1B 4SGA-FAN-1B	930'9" - col line B13	4SGA HT-1B 100502	4160 substation 41B	abc/tam ?		
72	60.012	mfc to 72 trans compt CT		—	4160 substation 41B			
73	60.013	mfc to SA main bkr		—	4160 substation 41A			
74	60.014	mfc to SA tie bus			4160 substation 41			
75	60.015	mfc to 45 tie brk *		—	4160 substation 41			
76	60.016	mfc to 45 main bkr		—	4160 substation 41B			
77	60.017	mfc to pa fan 1A 4SGA-FAN-1A	930'9" - col line A13	4SGA AN-1A 100501	4160 substation 41	abc/tam		
78	60.018	mfc to 15 spare *			4160 substation 41			
79	61.000	Make final connections (mfc) to equipment as noted in 61.000 series from 480 v substation 41 4APC-SUS-41		—	480 v substation 41	que/		
80	61.001	Make final connections to instruments - same as 61.004 *			480 v substation 41	tam/que		
81	61.002	Make final connections to battery charger 24C CAPH-CHGR-24C	890'0" col line 161A	CAPHE 100611	480 v substation 41B			
82	61.003	Make final connections to equipment spare *			480 v substation 41			
83	61.004	Make final connections to instruments 2 ?- same as 61.001? *			480 v substation 41	tam/que		
84	61.005	Make final connections to equipment *			480 v substation 41			
85	61.006	Make final connections to mcc 41 MAIN BKR 4APC-MCC-41		4APCE 100601	480 v substation 41			

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
86	61.007	Make final connections to instruments 3 ? XXXX			480 v substation 41	que/tam		
87	61.008	Make final connections to main bkr 1 BUS DUCT (600V)			480 v substation 41			
88	61.009	Blank 1 XXXX			480 v substation XFMR 41A			
89	61.010	Make final connections to lrg sub 4APB-LSUB-41		4APB 100601	480 v substation 41B			
90	61.011	Make final connections from 480 v substation to mcc 48 MAIN BKR 4APC-MCC-48	Cooling tower	4APC CC-48 100608	480 v substation 41B	que/		
91	61.012	Spare XXXX			480 v substation 41			
92	61.013	Make final connections from 480 v substation 41 to mcc 46 MAIN BKR 4APC-MCC-46	875'0" - col line B11	4APC CC-46 100654	480 v substation 41B	msu/que		
93	61.014	Make final connection from 480 v substation 41 to mcc 44 MAIN BKR 4APC-MCC-44		4APC CC-44 100604	480 v substation 41B	que		
94	61.015	Make final connections from 480 v substation 41 to mcc 42 MAIN BKR 4APC-MCC-42	851'0" - col line E12	4APC CC-42 100602	480 v substation 41	que/		
95	61.016	Make final connections to tie breaker XXXX			480 v substation 41			
96	61.017	Blank 2 XXXX			480 v substation 41			
97	61.018	Make final connections to fire pump from 480 v substation 41 / CNTRL CAB 4FPU-P-1	851'0" - col line E14	4FPU CC-41 100609	480 v substation 41A	que		
98	61.019	Make final connections to battery charger 24A CAPH-CHGR-24A	890' 0" - col line K12	CAPH HGR-24 100610	480 v substation #41B	que/		x
99	61.020	Spare 3 XXXX			480 v substation 41			
100	61.021	Make final connections to mcc 43 MAIN BKR 4APC-MCC-43	875'0" - col line E14	4APC CC-43 100603	480 v substation 41A	que/		
101	61.022	Make final connections from 480 v substation 41 to mcc 45 MAIN BKR 4APC-MCC-45	875'0" - col line B11	4APC CC-45 100651	480 v substation 41A	que/		
102	61.023	Make final connections from 480 v substation 41 to mcc 47 MAIN BKR 4APC-MCC-47	chemical / electrical building	4APC CC-47 100607	480 v substation 41A	que/		

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
103	61.024	Make final connections to main bkr #			480 v substation XFAR 41B			
104	61.025	Blank 3 X			480 v substation 41			
105	61.026	Make final connections to battery charger 24B CAPH-CHGR-24B	890' 0" - col line K12	CAPH- HGR-24 B	480 v substation #2	que/		x
106	62.000	Make final connections (mfc) to equipment as noted in 62.000 series from substation 2			substation 2			
107	62.001	Make final connections to battery charger 24B CAPH-CHGR-24C	890' 0" - col line K12	CAPH- HGR-24 B 100601	substation 2 480V substation #2	que/		
108	63.000	Make final connections (mfc) to equipment as noted in 63.000 series from substation 6			substation 6	que/		
109	63.001	Make final connctions from substation #6 to mcc 1A, 1B & 1C		CAPCE 100601	substation 480V substation #6	que/		
110	64.000	Make final connections (mfc) to equipment as noted in 64.000 series from boiler / turbine mcc 41			boiler / turbine mcc 41	que/		
111	64.001	Make final connections to bfw pump lube oil pump 2A 4FWA-P-2A	/		boiler / turbine mcc 41			
112	64.002	Make final connections to turb lube oil vapor exhauster 4TGD-EXH-1	/		boiler / turbine mcc 41			
113	64.003	Make final connections to turb gen main lube oil pum 1A 4TGD-P-1A	/		boiler / turbine mcc 41			
114	64.004	Make final connections to bed ash screw cooler feeder 3A 4SGA-CLR-3A	/		boiler / turbine mcc 41			
115	64.005	Make final connections to attemporator spray pump 1A 4FWG-P-1A	/		boiler / turbine mcc 41			
116	64.005	Make final connections to attemporator spray pump 1B 4FWG-P-1AB	/		boiler / turbine mcc 42			
117	64.006	Make final connections to stm seal inlet blk vlv 4TGC-BV-0001	/		boiler / turbine mcc 41			
118	64.007	Make final connections to turb ms drip leg 4SGG-MBV-0012	/		boiler / turbine mcc 41			
119	64.008	Make final connections to close cycle cooling water pump 4ECB-P-1A	/		boiler / turbine mcc 41			

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
120	64.009	Make final connections to attemp spray mxd air comp 4FWG-CMP-1		4FWAE 120101	boiler / turbine mcc 41			
121	64.010	Make final connections to mxd bed demin recycle pump 4FWG-P-2	/		boiler / turbine mcc 41			
122	64.011	Make final connections to turb css extrn stm vlv 4TEA-MBV-0005		4TEAE 120101	boiler / turbine mcc 41			
123	64.012	Make final connections to condenser hotwell pump 1A 4FWC-P-1A		4FACE 120101	boiler / turbine mcc 41			
124	64.013	Make final connections to turb gen drain valve 1 4TGC-DR-1		4TGCE 120101	boiler / turbine mcc 41			
125	64.014	Make final connections to turb gen drain valve 2 4TGC-DR-2		4TGCE 120102	boiler / turbine mcc 41			
126	64.015	Make final connections to turb gen drain valve 3 4TGC-DR-3		4TGCE 120103	boiler / turbine mcc 41			
127	64.016	Make final connections to enc fluid pump 1A 4TGF-P-1A		4TGFE 120101	boiler / turbine mcc 41			
128	64.017	Make final connections to bldg htng condensate return pumps 1A & 1B, 4SCA-P-1A, & 4SCA-P-1B		4SCAE 120101	boiler / turbine mcc 41			
129	64.018	Make final connections to boiler area 480 v pwr pni 41 4APC-PPL-41	851'0" - col line B.4-12	4APC-E 41-41 120101	boiler / turbine mcc 41	que		
130	64.019	Make final connections to attemp spray cross tie Isol 4FWA-MBV-0023		4FWAE 120103	boiler / turbine mcc 41			
131	64.020	Make final connections to turb uncntrl extrn stm vlv 4TEA-MBV-0001		4TEAE 120102	boiler / turbine mcc 41			
132	64.021	Make final connections to turb extrn dripleg vlv 2 4TEC-MBV-0002		4TECE 120101	boiler / turbine mcc 41			
133	64.022	Make final connections to turb extrn dripleg vlv 8 4TEC-MBV-0008		4TECE 120102	boiler / turbine mcc 41			
134	64.023	Incoming from 480 v sus bus 41A 4APC-SUS-41		4APC-E 41-41 120101	boiler / turbine mcc 41			
135	65.000	Make final connections (mfc) to equipment as noted in 65.000 series from boiler / turbine mcc 42			boiler / turbine mcc 42	que/		
136	65.001	Make final connections to bfw pump lube oil pump 2B 4FWA-P-2B		4FWAE 120102	boiler / turbine mcc 42			

64.023? TURB CNRL EXTRN AFTER BLK
VLV DRIP LEG 4TGC-DR-3

4TECE
120105 MCC 41

in oen listing

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
137	65.002	Make final connections to turb gen aux lube oil pum 1B 4TGO-P-1B		4TGE 120103	boiler / turbine mcc 42			
138	65.003	Make final connections to bed ash screw cooler feeder 3B 4SGA-CLR-3B		4SGAE 120102	boiler / turbine mcc 42			
139	65.004	Make final connections to turb ms drip leg 4SGG-MBV-0042 -0037		4SGGE 120102	boiler / turbine mcc 42			
140	65.005	Make final connections to closed cycle cooling water pump 1B 4ECB-P-1B		4ECBE 120102	boiler / turbine mcc 42			
141	65.006	Make final connections to attemp spray pp lub oil pump 4FWG-P-3A		4FWGE 120105	boiler / turbine mcc 42			
142	65.007	Make final connections to condenser hotwell pump 1B 4FWC-P-1B		4FWCE 120102	boiler / turbine mcc 42			
143	65.008	Make final connections to ehc fluid pump 1B 4TGF-P-1B		4TGFE 120102	boiler / turbine mcc 42			
144	65.009	Make final connections to bldg htng condensate rtn pumps 2A & 2B, 4SCA-P-2A, & 4SCAJ-P-2B		4SCAE 120102	boiler / turbine mcc 42			
145	65.010	Make final connections to attemp spray pp lube oil pump 4FWG-P-3B		4FWGE 120106	boiler / turbine mcc 42			
146	65.011	Make final connections to incoming from 480 v sus bus 41B 4APC-SUS-41		4APC-S US-41	boiler / turbine mcc 42			
147	65.012	Make final connections to turning gear 4TGA-TGR-1		4TGA 120101	boiler / turbine mcc 42			
148	65.013	Make final connections to gland steam condenser blower 4TGCJ-BLO-1		4TGC 120105	boiler / turbine mcc 42			
149	65.014	Make final connections to service water booster pump cab (vfd) CWSC-VDR-1		CWSC 120102	boiler / turbine mcc 42			
150	65.015	Make final connections to turb underfloor dry pipe air comp 4FPU-CMP-1		4FPU 120101	boiler / turbine mcc 42			
151	65.016	Make final connections to main steam header dripleg lvi cntrl vlv 4SGF-LCV-0013		4SGFE 120103	boiler / turbine mcc 42			
152	65.017	Make final connections to main steam header dripleg lvi cntrl vlv 4SGF-LCV-0014		4SGFE 120104	boiler / turbine mcc 42			
153	65.018	Make final connections to turb css extn dripleg vlv 14 4TEC-MBV-0014		4TECE 120103	boiler / turbine mcc 42			
65.0??		TURB. BEFORE STDP VLV DRIP LEG 4SGG-MBV-0037		4SGGE 120102	B/T mcc 42			
65.0??		BFW PUMP LUBE OIL PUMP 2B 4FWA-P-2B in oen listing		4FWAE 120102	B/T mcc 42			

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
154	65.019	Make final connections to turb css extn dripleg vlv 20 4TEC-MBV-0020		4TECE 120104	boiler / turbine mcc 42			
155	65.020	Make final connections to cond outlet valve 4HRC-MBV-16		4HRCE 120101	boiler / turbine mcc 42			
156	65.021	Make final connections to cond inlet valve 4HRC-MBV-17		4HRCE 120102	boiler / turbine mcc 42			
157	65.022	Make final connections to attenuator spray pump 1B 4EWS-P-1B			boiler / turbine mcc 42			
158	65.023	Make final connections to boiler area 480 v pwr panel 42 4APC-PPL-42	851'0" - col line E12	4APCE 120102 120602	boiler / turbine mcc 42	que/		
159	66.000	Make final connections (mfc) to equipment as noted in 66.000 series from boiler turbine mcc 43			boiler / turbine mcc 43	que/		
160	66.001	Make final connections to coal conveyor drive system 4CHD-BLT-1		4CHDE 120210	boiler / turbine mcc 43			
161	66.002	Make final connections to coal handling tripper drive system 4CHD-TPR-1		4CHDE 120211	boiler / turbine mcc 43			
162	66.003	Make final connections to sand chute gate 1A 4BME-CHE-1A		4BME 120201	boiler / turbine mcc 43			
163	66.004	Make final connections to coal tripper dry air compressor 4FPU-CMP-2 FIRE PROTECTION		4FPUE 120201	boiler / turbine mcc 43			
164	66.005	Make final connections to control air compress 1A 4CAB-CMP-1A		4CABE 120201	boiler / turbine mcc 43			
165	66.006	Make final connections to coal discharge gate 2A 4CHD-GAT-2A		4CHDE 120202	boiler / turbine mcc 43			
166	66.007	Make final connections to coal discharge gate 2B 4CHD-GAT-2B		4CHDE 120203	boiler / turbine mcc 43			
167	66.008	Make final connections to coal feed chute gate 3A 4CHD-GAT-3A		4CHDE 120206	boiler / turbine mcc 43			
168	66.009	Make final connections to coal feed chute gate 3B 4CHD-GAT-3B		4CHDE 120207	boiler / turbine mcc 43			
169	66.010	Make final connections to coal diverter gate 4CHD-GAT-4			boiler / turbine mcc 43			
170	66.011	Make final connections to incoming from 480 v sus bus 41A 4APC-SUS-41		4APCE 120201 120201	boiler / turbine mcc 43			

66.013

MFC TO BATTERY
ROOM AIR HANDLING UNIT
4SCA-AH4-1

4SCAE
120201

in oen listing

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
171	67.000	Make final connections (mfc) to equipment as noted in 67.000 series from boiler / turbine mcc 44			boiler / turbine mcc 44	que/		
172	67.001	Make final connections to attempt spray blk vlv 4FWG -MBV-25		4FWGE 120201	boiler / turbine mcc 44			
173	67.002	Make final connections to incoming line from 480 v sus bus 41B 4APC-USU-41		4APC-USU-41	boiler / turbine mcc 44			
174	67.003	Make final connections to coal discharge gate 2C 4CHD-GAT-2C		4CHDE 120204	boiler / turbine mcc 44			
175	67.004	Make final connections to coal discharge gate 2D 4CHD-GAT-2D		4CH2E 120205	boiler / turbine mcc 44			
176	67.005	Make final connections to coal feed chute gate 3C 4CHD-GAT-3C		4CHDE 120208	boiler / turbine mcc 44			
177	67.006	Make final connections to coal feed chute gate 3D 4CHD-GAT-3D		4CHDE 120209	boiler / turbine mcc 44			
178	67.007 66.012	Make final connections to boiler area 480 v pwr pnl 43 4APC-PPL-43	875'0" - col line C.3 - 14	4APC-PPL-43 120201	boiler / turbine mcc 43	que/		
179	67.008	Make final connections to sand rotary screw feeder 4BME-FDR-1		4BME 120203	boiler / turbine mcc 44			
180	67.009	Make final connections to control air compressor 1B 4CAB-CMP-1B		4CABE 120202	boiler / turbine mcc 44			
181	67.010	Make final connections to sand discharge gate 4BME-GAT-1		4BME 120204	boiler / turbine mcc 44			
182	67.011	Make final connections to sand chute gate 1B 4BME-CHE-1B		4BME 120202	boiler / turbine mcc 44			
183	67.012	Make final connections to unit 4 elevator 4BSA-ELEV-2		4BSAE 120203	boiler / turbine mcc 44			
184	68.000	Make final connections (mfc) to equipment as noted in 68.000 series from fabric filter mcc 45			fabric filter mcc 45	que/		
185	68.001	Make final connections to urea bldg 480 v pwr pnl 45 4APC-PPL-45	851'0" - urea building	4APC-PPL-45 120302	fabric filter mcc 45	que/		
186	68.002	Make final connections to fluoseal blower 1A 4SGA-BLO-1A		4SGAE 120301	fabric filter mcc 45			
187	68.003	Make final connections to primary air fan 1A outlet damper 4SGA-DMPR-1A		4SGAE 120303	fabric filter mcc 45			
	67.012	DESC DRYER CNTRL PANEL 4CAB-PNL-1		4CABE 120210	B/T mcc 46			

in oen listing

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
188	68.004	Make final connections to secondary air fan 2A outlet damper 4SGA-DMPR-2A		45GA E 120305	fabric filter mcc 45			
189	68.005	Make final connections to secondary air fan 2A 4SGA-FAN-2A		45GA E 120307	fabric filter mcc 45			
190	68.006	Make final connections to soot blower cont cab 4SGI-CAB-1		45GIE 120301	fabric filter mcc 45			
191	68.007	Make final connections to limestone rotary feed valve 2A 4BMD-FDR-2A		4BMDE 120303	fabric filter mcc 45			
192	68.008	Make final connections to ash conditioner 4ASF-MIX-1		4ASF E 120302	fabric filter mcc 45			
193	68.009	Make final connections to ash handling vacuum exhauster 1A 4ASG-EXH-1A		4ASG E 120301	fabric filter mcc 45			
194	68.010	Make final connections to limestone discharge gate 1A 4BMD-GAT-1A		4BMDE 120301	fabric filter mcc 45			
195	68.011	Make final connections to limestone conveying sys blower 1A 4BMD-BLO-1A		4BMDE 120301	fabric filter mcc 45			
196	68.012	Make final connections to rev air ^{gas} fan 2A 4CCB-FAN-2A		4CCBE 120301	fabric filter mcc 45			
197	68.013	Make final connections to noxout snr sys circ pump 1A 4SGL-P-1A		45GLE 120301	fabric filter mcc 45			
198	68.014	Make final connections to noxout snr sys circ pump 3A 4SGL-P-3A WATER		45GLE 120301	fabric filter mcc 45			
199	68.015	Make final connections to incoming line from 480 v sus bus 41A 4APC-SUS-41		4APC B 48-11 100651	fabric filter mcc 45			
200	69.000	Make final connections (mfc) to equipment as noted in 69.000 series from fabric filter mcc 46		—	fabric filter mcc 46			
201	69.001	Make final connections to noxout snr sys circ pump 1B 4SGL-P-1B		45GLE 120302	fabric filter mcc 46			
202	69.001	Make final connections to limestone rotary feed valve 2B 4BMD-FDR-2B		4BMDE 120304	fabric filter mcc 46			
203	69.002	Make final connections to noxout snr sys circ pump 3B 4SGL-P-3B WATER		45GLE 120304	fabric filter mcc 46			
204	69.003	Make final connections to incoming line from 480 v sus bus 41B 4APC-SUS-41		4APC B 48-11 100653	fabric filter mcc 46			

69.0??	MFC to UNIT 4 OVERHEAD EQUIP. HOIST 4BSA-HST-1	4BSAE 120301	FABRK FILTER mcc 46
69.0??	ASH SILD OUTLET VLV 4ASF-MOV-0005	4ASF E 120301	" " mcc 46

in oen listing

8/15/92

msu pp #4 elect const laundry list

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69.0??

REV. AIR GAS FAN 2B

4CCB-FAN-2B

4CCBE

120302

	oen	activity or item	location	circuit #	make final conn from	resp	dellv date	on job
205	69.004	Make final connections to limestone discharge gate 1B 4BMD-GAT-1B		4BMD 120306	fabric filer mcc 46			
206	69.005	Make final connections to limestone conveying sys blower 1B 4BMD-BLD-1B		4BMD 120302	fabric filer mcc 46			
207	69.006	Make final connections to rev air gas fan 2B 4CCB-FAN-2B		4CCBE 120302	fabric filer mcc 46			
208	69.007	Make final connections to ash silo fldzg air heater 4ASF-HTR-1		4ASF 120303	fabric filer mcc 46			
209	69.008	Make final connections (mfc) to ash unloading room vent fan 4SCA-FAN-1		4SCAE 120301	fabric filer mcc 46			
210	69.011	Make final connections to primary air fan 1B outlet damper 4SGA-DMPR-1B		4SGAE 120304	fabric filer mcc 46			
211	69.011	Make final connections to ash handling vacuum exhauster 1B 4ASG-EXH-1B		4ASGE 120302	fabric filer mcc 46			
212	69.012	Make final connections to secondary air fan 2B outlet damper 4SGA-DMPR-2B		4SGAE 120306	fabric filer mcc 46			
213	69.013	Make final connections to secondary air fan 2B 4SGA-FAN-2B		4SGAE 120308	fabric filer mcc 46			
214	69.014	Make final connections to fabric filter 480 v hop htr cntrl pnl 4CCB-CPL-1		4CCBE 4CCB 120304	fabric filer mcc 46			
215	69.015	Make final connections to fluoseal blowr 1B 4SGA-BLO-1B		4SGAE 120302	fabric filer mcc 46			
216	69.016	Make final connections to boiler area 480 v pwr pnl 44 4APC-PPL-44	875'0" - col line E14	4APCE 4APC 120301	fabric filer mcc 46	que/		
217	70.000	Make final connections (mfc) to equipment as noted in 70.000 series from cooling tower mcc 47			cooling tower mcc 47	que/		
218	70.001	Make final connections to cooling tower fan 1B 4HRC-MAN-1B		4HRC 120406	cooling tower mcc 47			
219	70.002	Make final connections to cooling tower 480 - 120/208 v ltng xfmr 47 4APB-LXF-47	chemical / electrical building	4APBE 4APB 120401	cooling tower mcc 47	que		
220	70.003	Make final connections to cooling tower fan 1A 4HRC-MAN-1A		4HRC 120405	cooling tower mcc 47			
221	70.004	Make final connections to cooling tower bypass valve 4HRC-MBV-0014		4HRC 120413	cooling tower mcc 47			

in oen listing

	oen	activity or item	location	circuit #	make final conn from	resp	deliv date	on job
222	70.005	Make final connections to circ water pump 1A 4HRC-P-1A		4HRC 120409	cooling tower mcc 47			
223	70.006	Make final connections to circ water pump 1B 4HRC-P-1B		4HRC 120410	cooling tower mcc 47			
224	70.007	Make final connections to incoming line from 480 v sus bus 41A 4APC-SUS -41		4APC-5 45-41 100607	cooling tower mcc 47			
225	71.000	Make final connections (mfc) to equipment as noted in 71.000 series from cooling tower mcc 48	Cooling tower	4APC-5 66-48 100608	cooling tower mcc 48	que/		
226	71.001	Make final connections to circ water pump 1C 4HRC-P-1C		4HRC 120411	cooling tower mcc 48			
227	71.002	Make final connections to circ water pump 1D 4HRC-P-1D		4HRC 120412	cooling tower mcc 48			
228	71.003	Cooling tower 480 v ltn g xfmr 48 4APB-LXF-48		4APB-5 XF-48 120402	cooling tower mcc 48			
229	71.004	Make final connections to cooling tower fan 1D 4HRC-MFAN-1D		4HRC 120408	cooling tower mcc 48			
230	71.005	Make final connections to cooling tower fan 1C 4HRC-MFAN-1C		4HRC 120407	cooling tower mcc 48			
231	71.006	Make final connections to lube oil skid ELECTRICAL UNIT HEATERS 4SCE-EUHT-3, 2, 1		4SCE 120401	1111 mcc 48			
232	73.000	Make final connections to 15 kv switchgear						
233	74.000	Make final connections to 5 kv switchgear						
234	75.000	Make final connections to 600 v switchgear						
235	76.000	Make final connections to dcs 428, 429, 437, 432, 411 & 412 on mcc's				que/		
236	77.000	Make final connections to free standing dcs cabinets						
237	78.000	Make final connections to high voltage transformers						
238	79.000	Make final connections to new ois at existing control room						

	abb	oen
1	ac - alternating current ?	92.000
2	b&v - Black & Veatch	90.000
3	bai - Bailey Controls	87.000
4	bfw - boiler feed water	99.000
5	c/e - chemical electric building	93.000
6	cto - cooling tower	94.000
7	dafd - detail, approve, fabricate & deliver	86.000
8	dcS - distributed control systems ?	84.000
9	ess - essential systems	83.000
1 0	ffb - fabric filter building	95.000
1 1	mcc - motor control center	85.000
1 2	mfc - make final connections	98.000
1 3	n - north	96.000
1 4	ofe - owner furnished equipment	91.000
1 5	ois - ?	100.000
1 6	que - Quality Electric	89.000
1 7	s - south	97.000
1 8	wes - Westinghouse	88.000

in alphabetical listing

1. 8:46:41 AM - Tuesday, August 4, 1992

1.1. Those attending

1.1.1. Jim Simons - MSU - Project Representative

1.1.2. Rick Johnson - MSU - Electrical Engineer

1.1.3. Ralph J. Stephenson - Consultant

1.2. Agenda

1.2.1. Continue or complete prepare electrical mfc (make final connections) series
data base

network model format

*To do w/
Rick J.
today.*

1.2.2. Review and tabulate where we stand on planning project components

Network models for issue #6

Alberici/Clark - A/C - General project manager

Building close in

Coal conveyor system

Elevator

*} A/C has said to
issue*

Tampella Power - TAM - Fluidized bed steam generator

General Electric - GEC - Turbine generator

Duval - DUV - Instrumentation

Industrial Mechanical Contractors - IMC

Quality Electric - QUE

Power routing system

Service power system

Cable tray, conduit & wire, transmission system

Equipment terminations system (mfc - make final connections)

Control systems

Essential services systems - ess (or uninterruptable power systems - ups)

Chargers

Batteries

Invertors

Lighting system

Miscellaneous

Communications

*To be
commented
on by
Wed
Aug 5, 92*

Convenience receptacles

Environmental elements corporation - EEC - fabric filter building

Thermal Dynamics - TDY - Cooling tower contractor

Bailey Controls - bco - Control system designer and supplier

Controlled Power Corporation - CPC - Electrical switchgear designer & supplier

1.2.3. Discuss and decide on master data base monitoring format for entire project

1.2.4. Review current status of Picketing status, background and impacts

1.2.5. Make detailed inspection of project and monitor

1.2.6. Print out and issue network models available currently

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ph 517 772 2537

July 21, 1992

I have been using the following loose definitions of the main elements of the electrical system on the project. These should be reviewed by the project team before using formally.



Service power system - The portion of the system containing the following:

- New turbine generator - as a source of power only
- Existing turbine generator - as a source of power only
- 13.8 kv switchgear
- 4160 v transformer
- 480 v transformers
- 480 v switchgear (some may be included in power routing system)
- 4160 v substation (some may be included in power routing system)
- Cable connecting the above equipment
- Cable connecting the service power system to the power routing system
(my name for the mcc's and other devices that route the power from the service power system into the various distribution channels to the using equipment).



Power routing system - The portion of the system containing the following:

- The main devices and equipment such as motor control systems that route the power from the service power system to the cable tray and other routes along which wire and cable is laid and connected. The current elements of the power routing system seem to include the following:

4160 v substation (also in service power system)
480 v substation (also in service power system)
Boiler and turbine mcc #41
Boiler and turbine mcc #42
Boiler and turbine mcc #43
Boiler and turbine mcc #44
Fabric and filter mcc #45
Fabric and filter mcc #46
Cooling tower mcc #47
Cooling tower mcc #48
Riser conduit out of equipment



Cable and wire carrying system - The portion of the system containing the following:

- Bulk cable tray - from equipment riser to equipment riser

(Communication)
Check on
separation of
instrumentation & control
from other equip

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July 21, 1992

- Bulk conduit- that conduit installed to the junction boxes
- Wire or cable laying in cable tray from riser conduit to riser conduit (? - to be reviewed)
- Wire or cable in conduit and running from junction boxes to junction boxes.

(D) Final equipment destination system - The portion of the system containing the following:

- All equipment and equipment components to which electrical connections must be made from the cable and wire carrying system.

This includes all equipment listed by A/C in their tabulation of B&V's equipment to which final connections must be made.

I have diagrammed the service power system, the power routing system without wire or cable, and portions of the cable and wire carrying system (bulk conduit and cable tray installation). I have not diagrammed any major wire or cable pulling since Quality Electric prefers to have the final equipment in place before installing wire and cable. The final equipment placement, installation of wire, and making final connections will be done as more information becomes available on making final connections (mfc).

The preliminary listing of equipment to which final connections are to be made is shown in the electrical construction laundry list issue #1, dated 07/19/92. mfc equipment is contained in items 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, and in 72 through 79. This was provided to me by A/C, and was presumably taken directly from the design drawings by B & V.

5.) Jim will have his field staff identify all electrical equipment and its installation. They will help obtain the following information:

- Location of all final connection equipment shown on the electrical construction laundry list.
- Responsibility identification of all who are to be involved in the activities in the electrical construction laundry list.
- Provide up to date information on expected delivery dates of owner furnished equipment (ofc)
- Provide information as required on portions of the control systems that are the responsibility of MSU.

6.) At present it appears that we will diagram the mechanical construction (IMC), the fabric filter building, and the control systems in a manner somewhat like the planning of the electrical work. This planning process however is to be further discussed. The sequence of planning is to be mechanical construction first, fabric filter building next, and control systems next.

	activity	sub title	earliest start	earliest finish	type	days	s#	comp
1	000001- MILE BUILDING ENCLOSURE COMPLETE - 1	MILE-4	11/4/92	11/4/92	Milestone	1	04	
2	000002-MILE CHEM/ELECTRICAL BUILDING COMPLETE - 1	MILE-4	8/5/92	8/5/92	Milestone	1	04	
3	000010-T/R TO AWARD CONTRACT TO ALBERICI/CLARK - 11/04/91 *	A/C-1	11/4/91	11/4/91	Task	0	01	x
4	000015-A/C MOBILIZATION - 5	A/C-1	11/4/91	11/8/91	Task	5	01	x
5	000035-ALMET ERECT SEQUENCE 1 STRUCT STEEL - 5	ALMET-1	1/6/92	1/10/92	Task	5	01	x
6	000040-ALMET ERECT SEQUENCE 2 STRUCT STEEL - 5	ALMET-1	1/13/92	1/17/92	Task	5	01	x
7	000045- ALMET ERECT SEQUENCE 3 STRUCT STEEL - 6	ALMET-1	1/20/92	1/27/92	Task	6	01	x
8	000050-ALMET ERECT SEQUENCE 4 STRUCT STEEL - 5	ALMET-1	1/28/92	2/3/92	Task	5	01	x
9	000055-ALMET ERECT SEQUENCE 5 STRUCT STEEL - 6	ALMET-1	2/4/92	2/11/92	Task	6	01	x
10	000060-ALMET ERECT SEQUENCE 6 STRUCT STEEL - 6	ALMET-1	2/12/92	2/19/92	Task	6	01	x
11	000065- ALMET ERECT SEQUENCE 7 STRUCT STEEL - 2	ALMET-1	2/20/92	2/21/92	Task	2	01	x
12	000070-ALMET ERECT SEQUENCE 8 STRUCT STEEL - 3	ALMET-1	2/24/92	2/26/92	Task	3	01	x
13	000075-ALMET ERECT SEQUENCE 9 STRUCT STEEL - 5	ALMET-1	2/27/92	3/4/92	Task	5	01	x
14	000080-ALMET ERECT SEQUENCE 10 STRUCT STEEL - 2	ALMET-1	3/5/92	3/6/92	Task	2	01	x
15	000085- ALMET ERECT SEQUENCE 11 STRUCT STEEL - 4	ALMET-1	3/9/92	3/12/92	Task	4	01	x
16	000090-ALMET ERECT SEQUENCE 12 STRUCT STEEL - 2	ALMET-1	3/13/92	3/16/92	Task	2	01	
17	000100-ALMET ERECT SEQUENCE 13 STRUCT STEEL - 2	ALMET-1	3/17/92	3/18/92	Task	2	01	
18	000105-ALMET ERECT SEQUENCE 14 STRUCT STEEL - 3	ALMET-1	3/19/92	3/23/92	Task	3	01	
19	000110- ALMET ERECT SEQUENCE 15 STRUCT STEEL - 4	ALMET-1	3/24/92	3/27/92	Task	4	01	
20	000115-ALMET ERECT SEQUENCE 16 STRUCT STEEL - 2	ALMET-1	3/30/92	3/31/92	Task	2	01	
21	000120-ALMET ERECT SEQUENCE 17 STRUCT STEEL - 2	ALMET-1	4/1/92	4/2/92	Task	2	01	
22	000124-ALMET STRUCT STEEL COMPLETE - 1	ALMET-1	4/3/92	4/3/92	Task	1	01	
23	000125-ALMET ERECT LEAVE OUT STRUCT STEEL - 65	ALMET-1	4/6/92	7/7/92	Task	65	01	
24	010005-GEC GENERAL ELECTRIC MOBILIZATION - 4	GEC-4	7/7/92	7/10/92	Milestone	4	04	
25	010010-GEC TURBINE - PART INSTALL SOLE PLATES - 10	GEC-4	7/13/92	7/24/92	Milestone	10	04	
26	010010A-GEC TURBINE - COMP INSTALL SOLE PLATES - 5	GEC-4	7/27/92	7/31/92	Milestone	5	04	
27	010015-PART GEC TURBINE - SETUP AND INSTALL TB GENERATOR - 10	GEC-4	7/27/92	8/7/92	Milestone	10	04	
28	010015A-COMP GEC TURBINE - SETUP AND INSTALL TB GENERATOR - 5	GEC-4	8/10/92	8/14/92	Milestone	5	04	
29	010020-GEC TURBINE - INSTALL M.S.V. - 5	GEC-4	8/10/92	8/14/92	Milestone	5	04	

listed in ~~ch#~~, ~~cc~~, ~~of~~, ~~activity number~~ ~~sequence~~
activity # sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
3 0	010025-GEC TURBINE - SET LUBE OIL TANK - 2	GEC-4	8/17/92	8/18/92	Milestone	2	0 4	
3 1	010030-PART GEC TURBINE - INSTALL STEAM PIPING - 5	GEC-4	8/19/92	8/25/92	Milestone	5	0 4	
3 2	010030A-COMP GEC TURBINE - INSTALL STEAM PIPING - 15	GEC-4	8/26/92	9/16/92	Milestone	15	0 4	
3 3	010035-PART GEC TURBINE - INSTALL LUBE OIL PIPING - 5	GEC-4	8/26/92	9/1/92	Milestone	5	0 4	
3 4	010035A-COMP GEC TURBINE - INSTALL LUBE OIL PIPING - 15	GEC-4	9/2/92	9/23/92	Milestone	15	0 4	
3 5	010040-GEC TURBINE - PART ALIGN TO GENERATOR - 10	GEC-4	9/2/92	9/16/92	Milestone	10	0 4	
3 6	010040A-GEC TURBINE - CONT(1) ALIGN TO GENERATOR - 5	GEC-4	9/17/92	9/23/92	Milestone	5	0 4	
3 7	010040B-GEC TURBINE - COMP ALIGN TO GENERATOR - 5	GEC-4	9/24/92	9/30/92	Milestone	5	0 4	
3 8	010045-PART GEC TURBINE - INSTALL J-BOS, PT & SCT CABINETS - 5	GEC-4	9/17/92	9/23/92	Milestone	5	0 4	
3 9	010045A-COMP GEC TURBINE - INSTALL J-BOS, PT & SCT CABINETS - 5	GEC-4	9/24/92	9/30/92	Milestone	5	0 4	
4 0	010050-GEC TURBINE - INSTALL MOTOR CONTROL CENTER - 5	GEC-4	10/1/92	10/7/92	Milestone	5	0 4	
4 1	010060-PART GEC TURBINE - HARDWIRE CONTROL SYSTEM - 15	GEC-4	10/1/92	10/21/92	Milestone	15	0 4	
4 2	010060A-COMP GEC TURBINE - HARDWIRE CONTROL SYSTEM - 5	GEC-4	10/22/92	10/28/92	Milestone	5	0 4	
4 3	010065-GEC TURBINE - HARDWIRE PT & CTS - 30	GEC-4	9/24/92	11/4/92	Milestone	30	0 4	
4 4	010070-PART GEC TURBINE - PIPE FOR STEAM BLOW DOWN / BLOW DOWN - 10	GEC-4	10/22/92	11/4/92	Milestone	10	0 4	
4 5	010070A-COMP GEC TURBINE - PIPE FOR STEAM BLOW DOWN / BLOW DOWN - 5	GEC-4	11/5/92	11/11/92	Milestone	5	0 4	
4 6	010075-GEC TURBINE - PIPE COOLING WATER - 10	GEC-4	11/5/92	11/18/92	Milestone	10	0 4	
4 7	010080-GEC TURBINE - SYSTEMS CHECK OUT - 30	GEC-4	11/19/92	1/4/93	Milestone	30	0 4	
4 8	01055-GEC TURBINE - INSTALL PIPING AND VALVES - 5	GEC-4	10/1/92	10/7/92	Milestone	5	0 4	
4 9	020005-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - FORM/REBAR - 1	A/C-1	4/6/92	4/6/92	Task	1	01	
5 0	020010-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - POUR - 1	A/C-1	4/7/92	4/7/92	Task	1	01	
5 1	020015-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - CURE - 23	A/C-1	4/8/92	5/8/92	Task	23	01	
5 2	020020-A/C OPERATING FLOOR - FORM/REBAR - 1	A/C-1	4/7/92	4/7/92	Task	1	01	
5 3	020025-A/C OPERATING FLOOR - POUR - 1	A/C-1	4/8/92	4/9/92	Task	2	01	
5 4	020030-A/C OPERATING ROOM - CURE - 20	A/C-1	4/10/92	5/7/92	Task	20	01	
5 5	020035-A/C AIR HEATER, HEATER ASH LOAD FLOORS - FORM/REBAR - 1 *	A/C-1	4/8/92	4/8/92	Task	1	01	
5 6	020040-A/C AIR HEATER, HEATER ASH LOAD FLOORS - POUR - 1 *	A/C-1	4/10/92	4/10/92	Task	1	01	
5 7	020045-A/C AIR HEATER, HEATER ASH LOAD FLOORS - CURE - 23	A/C-1	4/13/92	5/13/92	Task	23	01	
5 8	020050-A/C BATTERY, SECONDARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/9/92	4/9/92	Task	1	01	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
59	020051-A/C SECONDARY FAN PEDESTALS - FORM/REBAR - 4	A/C-1	4/10/92	4/15/92	Task	4	01	
60	020055-A/C BATTERY, SECONDARY AIR FAN FLOOR - POUR - 1	A/C-1	4/13/92	4/13/92	Task	1	01	
61	020056-A/C SECONDARY FAN PEDESTALS - POUR - 1	A/C-1	4/16/92	4/16/92	Task	1	01	
62	020060-A/C BATTERY, SECONDARY AIR FAN FLOOR - CURE - 23	A/C-1	4/14/92	5/14/92	Task	23	01	
63	020061-A/C SECONDARY FAN PEDESTALS - CURE - 20	A/C-1	4/17/92	5/14/92	Task	20	01	
64	020065-A/C PRIMARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/10/92	4/10/92	Task	1	01	
65	020066-A/C PRIMARY AIR FAN PEDESTLES - FORM/REBAR - 4	A/C-1	4/13/92	4/16/92	Task	4	01	
66	020070-PRIMARY AIR FAN FLOOR - POUR - 1	A/C-1	4/14/92	4/14/92	Task	1	01	
67	020071-A/C PRIMARY FAN PEDESTLES - POUR - 1	A/C-1	4/17/92	4/17/92	Task	1	01	
68	020075-A/C PRIMARY AIR FAN FLOOR - CURE - 23	A/C-1	4/15/92	5/15/92	Task	23	01	
69	020076-A/C PRIMARY FAN PEDESTLES - CURE - 20	A/C-1	4/20/92	5/15/92	Task	20	01	
70	020080-A/C ELEVATOR MACHINE ROOM FLOOR - FORM/REBAR - 2	A/C-1	4/13/92	4/14/92	Task	2	01	
71	020085-A/C ELEVATOR MACHINE ROOM FLOOR - POUR - 1	A/C-1	4/15/92	4/15/92	Task	1	01	
72	020090-A/C ELEVATOR MACHINE ROOM FLOOR - CURE - 23	A/C-1	4/16/92	5/18/92	Task	23	01	
73	022000-A/C A/C PART DEMO THREE WINDOWS & CURB - 0	A/C-4	6/23/92	6/23/92	Milestone	0	04	
74	022000A - A/C A/C COMP DEMO THREE WINDOWS & CURB - 2	A/C-4	6/23/92	6/24/92	Milestone	2	04	
75	022005-A/C A/C - INSTALL DOORS AND HARDWARE - 2	A/C-4	6/30/92	7/1/92	Milestone	2	04	
76	030005-SCH - INTERIOR MASONRY WALLS - 11	SCH-4	7/7/92	7/21/92	Milestone	11	04	
77	030010-SCH EAST ELEV MASONRY 851 TO 905 - 2	SCH-4	7/22/92	7/23/92	Milestone	2	04	
78	030015-SCH EAST ELEV STONE 851 TO 905 - 2	SCH-4	7/24/92	7/27/92	Milestone	2	04	
79	030020-SCH EAST ELEV MASONRY 851 TO 967 - 2	SCH-4	7/24/92	7/27/92	Milestone	2	04	
80	030025-SCH EAST ELVE STONE 851 TO 967 - 2	SCH-4	7/28/92	7/29/92	Milestone	2	04	
81	030030-SCH PART ELECT / CHEM BUILDING MASONRY - 2	SCH-4	6/23/92	6/24/92	Milestone	2	04	
82	030030A-SCH COMP ELECT / CHEM BUILDING MASONRY - 3	SCH-4	6/25/92	6/29/92	Milestone	3	04	
83	030035-SCH SOUTH ELEVATION MASONRY - 12	SCH-4	7/28/92	8/12/92	Milestone	12	04	
84	030040-SCH SOUTH ELEVATION STONE - 13	SCH-4	8/13/92	8/31/92	Milestone	13	04	
85	030045-SCH NORTH ELEVATION MASONRY 851 TO 967 - 12	SCH-4	9/3/92	9/21/92	Milestone	12	04	
86	030050-SCH NORTH ELEVATION STONE 851 TO 967 - 14	SCH-4	9/22/92	10/9/92	Milestone	14	04	
87	030055-SCH WEST ELEVATION MASONRY F-K - 10	SCH-4	7/28/92	8/10/92	Milestone	10	04	

listed in ~~activity number~~ activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
8 8	030060-SCH WEST ELEVATION STONE F-K - 9	SCH-4	8/11/92	8/21/92	Milestone	9	0 4	
8 9	030065-SCH WEST ELEVATION MASONRY A-F - 20	SCH-4	8/11/92	9/8/92	Milestone	20	0 4	
9 0	030070-SCH WEST ELEVATION STONE A-F - 26	SCH-4	8/24/92	9/29/92	Milestone	26	0 4	
9 1	030075-SCH WEST ELEVATION MASONRY A-AA - 2	SCH-4	9/9/92	9/10/92	Milestone	2	0 4	
9 2	030080-SCH WEST ELEVATION STONE A-AA - 2	SCH-4	9/30/92	10/1/92	Milestone	2	0 4	
9 3	040005-GJOH SET ROOF STEEL - 5	GJOH-4	7/6/92	7/10/92	Milestone	5	0 4	
9 4	040010-GJOH INSTALL INTERIOR MISC. STEEL - 2	GJOH-4	7/13/92	7/14/92	Milestone	2	0 4	
9 5	050001-ZAC ZACK COMPANY MOBILIZATION - 5	ZAC-4	7/13/92	7/17/92	Milestone	5	0 4	
9 6	050002-ZAC COMP INTERIOR METAL WALL ELEV. 875 & 891 - 11	ZAC-4	7/28/92	8/11/92	Milestone	11	0 4	
9 7	050002-ZAC PART INTERIOR METAL WALL ELEV. 875 & 891 - 6	ZAC-4	7/20/92	7/27/92	Milestone	6	0 4	
9 8	050004-ZAC INTERIOR METAL WALL ELEV. 894 & 912 - 11	ZAC-4	7/28/92	8/11/92	Milestone	11	0 4	
9 9	050006-ZAC INTERIOR METAL WALL ELEV. 930 & 945 - 8	ZAC-4	8/12/92	8/21/92	Milestone	8	0 4	
100	050008-ZAC INTERIOR METAL WALL ELEV. 955 & 963 - 24	ZAC-4	8/24/92	9/25/92	Milestone	24	0 4	
101	050010-ZAC EAST ELEVATION METAL WALL PANELS - 10	ZAC-4	9/9/92	9/22/92	Milestone	10	0 4	
102	050015-ZAC SOUTH ELEVATION METAL WALL PANELS - 7	ZAC-4	9/23/92	10/1/92	Milestone	7	0 4	
103	050020-ZAC NORTH ELEVATION METAL WALL PANELS - 7	ZAC-4	10/16/92	10/26/92	Milestone	7	0 4	
104	050025-ZAC WEST ELEVATION METAL WALL PANELS - 10	ZAC-4	10/2/92	10/15/92	Milestone	10	0 4	
105	060001-CEI CEI ROOFING MOBILIZATION - 5	CEI-4	10/5/92	10/9/92	Milestone	5	0 4	
106	060005-CEI CHEM / ELECTRICAL BUILDING ROOFING - 4	CEI-4	7/13/92	7/16/92	Milestone	4	0 4	
107	060005-CEI PART CHEM/ELECTRICAL BUILDING ROOFING - 0	CEI-4	7/13/92	7/13/92	Milestone	0	0 4	
108	060005A-CEI COMP CHEM/ELECTRICAL BUILDING ROOFING - 4	CEI-4	7/13/92	7/16/92	Milestone	4	0 4	
109	060010-CEI GENERAL BUILDING ROOF COL. F - K @ 922.5 - 6	CEI-4	10/12/92	10/19/92	Milestone	6	0 4	
110	060015-CEI GENERAL BUILDING ROOF COL. E - F @ 967 - 3	CEI-4	10/20/92	10/22/92	Milestone	3	0 4	
111	060020-CEI GENERAL BUILDING ROOF COL. E - A @ 977.9 - 7	CEI-4	10/23/92	11/2/92	Milestone	7	0 4	
112	060025-CEI GENERAL BUILDING ROOF COL. A - AA @ 904 - 1	CEI-4	11/3/92	11/3/92	Milestone	1	0 4	
113	070002-WES CHEM / ELEC. CAULKING - 5	WES-4	6/30/92	7/7/92	Milestone	5	0 4	
114	070010-WES INTERIOR BUILDING CAULK & SEALANT - 50	WES-4	7/13/92	9/21/92	Milestone	50	0 4	
115	070015-WES CAULK EXTERIOR EAST ELEVATION - 5	WES-4	9/23/92	9/29/92	Milestone	5	0 4	
116	070020-WES CAULK EXTERIOR SOUTH ELEVATION - 5	WES-4	10/2/92	10/8/92	Milestone	5	0 4	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
117	070025-WES CAULK EXTERIOR NORTH ELEVATION - 5	WES-4	10/27/92	11/2/92	Milestone	5	04	
118	070030-WES CAULK EXTERIOR WEST ELEVATION - 5	WEX-4	10/16/92	10/22/92	Milestone	5	04	
119	080005-VAN PART DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 0	VAN-4	6/23/92	6/23/92	Milestone	0	04	
120	080005A-VAN COMP DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 5	VAN-4	6/23/92	6/29/92	Milestone	5	04	
121	090005-ESS DELIVER HARDWARE CHEM / ELEC BUILDING - 5	ESS-4	6/23/92	6/29/92	Milestone	5	04	
122	100005-ABP INSTALL EXTERIOR WINDOWS EAST ELEVATION - 5	ABP-4	10/5/92	10/9/92	Milestone	5	04	
123	100010-ABP INSTALL EXTERIOR WINDOWS SOUTH ELEVATION - 5	ABP-4	10/12/92	10/16/92	Milestone	5	04	
124	100015-ABP INSTALL EXTERIOR WINDOWS NORTH ELEVATION - 5	ABP-4	10/19/92	10/23/92	Milestone	5	04	
125	100020-ABP INSTALL EXTERIOR WINDOWS WEST ELEVATION - 5	ABP-4	10/26/92	10/30/92	Milestone	5	04	
126	115002-GMID CHEM/ELEC. PAINTING & SEAL FLOOR - 15	GMID-4	7/15/92	8/4/92	Milestone	15	04	
127	119000-ALL DELIVER LOUVERS CHEM/ELEC. BUILDING - 5	ALL-4	6/23/92	6/29/92	Milestone	5	04	
128	119005-ALL INDSTALL LOUVERS CHEM/ELEC. BUILDING - 2	ALL-4	6/30/92	7/1/92	Milestone	2	04	
129	130005-FAI DELIVER COAL CONVEYOR EQUIPMENT - 15	FAI-5	4/6/92	4/24/92	Task	15	05	
130	130010-FAI PART REWORK EXIST. 24" FEED CONVEYOR - 0	FAI-5	5/4/92	5/4/92	Task	0	05	
131	130010A-FAI COMP REWORK EXIST. 24" FEED CONVEYOR - 41	FAI-5	5/4/92	6/30/92	Task	41	05	
132	130015-FAI COMP DELIVER TRIPPER ROOM ROOF STEEL - 5	FAI-5	5/18/92	5/22/92	Task	5	05	
133	130015-FAI PART DELIVER TRIPPER ROOM ROOF STEEL - 10	FAI-5	5/4/92	5/15/92	Task	10	05	
134	130020-FAI INSTALL TRIPPER ROOM ROOF STEEL - 14	FAI-5	5/18/92	6/5/92	Task	14	05	
135	130025-FAI DELIVER NEW BUNKER FEED BELT CONVEYOR - 2-15/E-F - 19	FAI-5	6/2/92	6/26/92	Task	19	05	
136	130030-FAI INSTALL NEW BUNKER FEED BELT CONVEYOR - 2-15/E-F - 24	FAI-5	7/7/92	8/7/92	Task	24	05	
137	130035-FAI DELIVER BUNKER PURGE CONVEYOR - 10-15/E-F - 15	FAI-5	7/6/92	7/24/92	Task	15	05	
138	130040-FAI INSTALL BUNKER PURGE CONVEYOR - 10-15/E-F - 30	FAI-5	7/27/92	9/4/92	Task	30	05	
139	130045-FAI DELIVER EXISTING PURGE CONVEYOR DISCHARGE - 15	FAI-5	7/27/92	8/14/92	Task	15	05	
140	130050-FAI INSTALL EXISTING PURGE CONVEYOR DISCHARGE - 25	FAI-5	8/24/92	9/28/92	Task	25	05	
141	135005-MOR PART INSTALL SILO FILL AREA SPRINKLER PIPING - 0	MOR-5	8/3/92	8/3/92	Task	0	05	
142	135005A-MOR COMP INSTALL SILO FILL AREA SPRINKLER PIPING - 15	MOR-5	8/3/92	8/21/92	Task	15	05	
143	135010-MOR INSTALL EXISTING COAL CONVEYOR SPRINKLER PIPING - 22	MOR-5	8/3/92	9/1/92	Task	22	05	
144	135015-MOR INSTALL FIRE & JOCKEY PUMPS - 5	MOR-5	9/2/92	9/9/92	Task	5	05	
145	135020-MOR PART INSTALL FIRE PUMP SUCTION PIPING - 0	MOR-5	9/9/92	9/9/92	Task	0	05	

listed in ~~11/1/92~~ activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
146	135020A-MOR COMP INSTALL FIRE PUMP SUCTION PIPING - 5	MOR-5	9/10/92	9/16/92	Task	5	05	
147	135025-MOR INSTALL FIRE PUMP DISCHARGE PIPING - 5	MOR-5	9/10/92	9/16/92	Task	5	05	
148	135030-MOR INSTALL TURBINE BULD. HEADERS / RUNOUTS TO HOSE ST - 15	MOR-5	9/17/92	10/7/92	Task	15	05	
149	135035-MOR INSTALL BOILER BULD. HEADERS / RUNOUTS TO HOSE ST - 15	MOR-5	10/8/92	10/28/92	Task	15	05	
150	135040-MOR INSTALL VALVE STATIONS - 5	MOR-5	10/29/92	11/4/92	Task	5	05	
151	135045-MOR INSTALL TURBINE UNDERFLOOR SPRINKLER PIPE - 14	MOR-5	11/5/92	11/24/92	Task	14	05	
152	135050-MOR PART INSTALL TURBINE / GENERATOR BEARING SYSTEM - 14	MOR-5	11/25/92	12/15/92	Task	14	05	
153	135050A-MOR COMP INSTALL TURBINE / GENERATOR BEARING SYSTEM - 14	MOR-5	12/16/92	1/6/93	Task	14	05	
154	135055-MOR PART INSTALL HOSE RACKS - 0	MOR-5	1/6/93	1/6/93	Task	0	05	
155	135055A-MOR COMP INSTALL HOSE RACKS - 5	TAM-5	1/7/93	1/13/93	Task	5	05	
156	135060-MOR INSTALL FIRE PANELS AND EQUIPMENT - 5	MOR-5	1/11/93	1/15/93	Task	5	05	
157	135065-MOR INSTALL AND WIRE ALARM SYSTEM - 25	MOR-5	1/18/93	2/19/93	Task	25	05	
158	135070-MOR TEST AND CHECK OUT FIRE ALARM SYSTEM - 5	MOR-5	2/22/93	2/26/93	Task	5	05	
159	135075 - MOR COMMISSION FIRE PROTECTION SYSTEM - 1	MOR-5	3/1/93	3/1/93	Task	1	05	
160	136001-THE - THERMAL - DYNAMIC MOBILIZATION - 5	THE-5	6/22/92	6/26/92	Task	5	05	
161	136005-THE - PART COOLING TOWER STRUCTURAL FRAMING - 15	THE-5	6/29/92	7/20/92	Task	15	05	
162	136005A-THE - COMP COOLING TOWER STRUCTURAL FRAMING - 5	THE-5	7/21/92	7/27/92	Task	5	05	
163	136010-THE - COOLING TOWER PARTITION WALLS - 6	THE-5	7/21/92	7/28/92	Task	6	05	
164	136015-THE - COOLING TOWER WIND WALLS - 6	THE-5	7/29/92	8/5/92	Task	6	05	
165	136020-THE - COOLING TOWER FILL - 12	THE-5	7/22/92	8/6/92	Task	12	05	
166	136025-THE - COMP COOLING TOWER DISTRIBUTION - 5	THE-5	7/22/92	7/28/92	Task	5	05	
167	136025-THE - PART COOLING TOWER DISTRIBUTION - 1	THE-5	7/21/92	7/21/92	Task	1	05	
168	136030-THE - COOLING TOWER DRIFT ELIMINATORS - 4	THE-5	8/7/92	8/12/92	Task	4	05	
169	136035-THE - PART COOLING TOWER DECK FAN - 5	THE-5	7/28/92	8/3/92	Task	5	05	
170	136035A-THE - COMP COOLING TOWER DECK FAN - 2	THE-5	8/4/92	8/5/92	Task	2	05	
171	136040-THE - COOLING TOWER MECHANICAL - 7	THE-5	8/4/92	8/12/92	Task	7	05	
172	136045-THE - COOLING TOWER FAN STACKS - 6	THE-5	8/6/92	8/13/92	Task	6	05	
173	136050-THE - PART COOLING TOWER CASING - 5	THE-5	8/4/92	8/10/92	Task	5	05	
174	136050A-THE - COMP COOLING TOWER CASING - 2	TH3-5	8/11/92	8/12/92	Task	2	05	

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175	136055-THE - COOLING TOWER STAIR TOWER - 4	THE-5	8/6/92	8/11/92	Task	4	05	
176	136060-THE - COOLING TOWER ESCAPE LADDER - 3	THE-5	8/12/92	8/14/92	Task	3	05	
177	136065-THE - PART COOLING TOWER MISCELLANEOUS - 2	THE-5	8/17/92	8/18/92	Task	2	05	
178	136065A-THE - COMP COOLING TOWER MISCELLANEOUS - 1	THE-5	8/19/92	8/19/92	Task	1	05	
179	136070-THE - COOLING TOWER CLEAN UP / DEMOBILIZATION - 1	THE-5	8/20/92	8/20/92	Task	1	05	
180	140000-TAMPELLA MOBILIZATION - 15	TAM-1	3/2/92	3/20/92	Task	15	01	
181	140002-TAM INSTALL LIMESTONE SILO - 1	TAM-2	3/23/92	3/23/92	Task	1	02	
182	140004-TAM - LIMESTONE FOUNDATION STRUCTURE - 1	TAM-2	3/23/92	3/23/92	Task	1	02	
183	140006-TAM GROUND ASSEMBLE - CYCLONE - 40	TAM-3	3/23/92	5/15/92	Milestone	40	03	
184	140008-TAM GROUND ASSEMBLE DUCT - ECON TO AH - 7	TAM-2	3/23/92	3/31/92	Task	7	02	
185	140010-TAM ROUGH SET DUCT - AIR HEATER TO PLENUM - 2	TAM-1	3/23/92	3/24/92	Task	2	01	
186	140012-TAM SET SAND BIN - 2	TAM-1	3/23/92	3/24/92	Task	2	01	
187	140014-TAM ROUGH SET - FURN DW LOWER HDR - 1	TAM-1	3/23/92	3/23/92	Task	1	01	
188	140016-TAM ROUGH SET DOWNCOMBERS - 2	TAM-1	3/25/92	3/26/92	Task	2	01	
189	140018-TAM ROUGH SET - FURN SW LOWER HDR - 1	TAM-1	3/24/92	3/24/92	Task	1	01	
190	140020-TAM ROUGH SET - FLOOR/PLENUM - 1	TAM-1	3/25/92	3/25/92	Task	1	01	
191	140022-TAM INSTALL FLUOSEAL SUPPORT STEEL - 3	TAM-1	3/25/92	3/27/92	Task	3	01	
192	140024-TAM ROUGH SET - BUCKSTAYS - 4	TAM-1	3/26/92	3/31/92	Task	4	01	
193	140026-TAM ROUGH SET - FLUOSEAL - 2	TAM-1	3/30/92	3/31/92	Task	2	01	
194	140028-TAM ROUGH SET - COAL GRAVIMETRIC FEEDER - 2	TAM-1	4/1/92	4/2/92	Task	2	01	
195	140030-TAM ERECT - FLUOSEAL/J VALVE - 6	TAM-1	4/1/92	4/8/92	Task	6	01	
196	140032-TAM ROUGH SET - FLUOSEAL DISCHARGE LEG - 2	TAM-1	4/1/92	4/2/92	Task	2	01	
197	140034-TAM ERECT - COAL GRAVIMETRIC FEEDER - 8	TAM-1	4/3/92	4/14/92	Task	8	01	
198	140036-TAM ROUGH SET - BURNERS & PREPIPE RACK - 1	TAM-1	4/3/92	4/3/92	Task	1	01	
199	140038-TAM INSTALL COMBUSTION TOP GRID STEEL - 7	TAM-1	4/6/92	4/14/92	Task	7	01	
200	140040-TAM ROUGH SET - CYCLONE INLET EXPANSION JOINT - 1	TAM-1	4/9/92	4/9/92	Task	1	01	
201	140042-TAM ERECT DUCT - PRI AIR AH TO PLENUM - 30 *	TAM-1	4/9/92	5/20/92	Task	30	01	
202	140044-TAM INSTALL - FLUIDIZING BLOWER - 6	TAM-1	4/9/92	4/16/92	Task	6	01	
203	140046-TAM INSTALL - CYCLONE SUPPORT STEEL - 5	TAM-1	4/15/92	4/21/92	Task	5	01	

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204	140048-TAM INSTALL STEAM DRUM - 3	TAM-1	4/15/92	4/17/92	Task	3	01	
205	140050-TAM GROUND ASSEMBLE - AIR HEATER HOPPER - 4	TAM-2	3/30/92	4/2/92	Task	4	02	
206	140052-TAM INSTALL COMBUSTOR BOILER HANGERS - 10	TAM-1	4/20/92	5/1/92	Task	10	01	
207	140054-TAM INSTALL - FLUIDIZING DUCT - 15	TAM-1	4/17/92	5/7/92	Task	15	01	
208	140056-TAM LIMESTONE GRAVIMETRIC FEEDER - 3	TAM-3	4/3/92	4/7/92	Milestone	3	03	
209	140058-TAM ROUGH SET DUCT - SEC AIR AH TO BUSTLE - 2	TAM-1	4/15/92	4/16/92	Task	2	01	
210	140060-TAM ROUGH SET DUCT - COAL FD PURGE AIR - 2 *	TAM-1	4/17/92	4/20/92	Task	2	01	
211	140062-TAM ROUGH SET - SCREW CONVEYOR SAND - 2	TAM-1	4/14/92	4/15/92	Task	2	01	
212	140064-TAM ROUGH SET - OF DUCT BUSTLE TO BURNERS - 2	TAM-1	4/21/92	4/22/92	Task	2	01	
213	140066-TAM UPPER COMBUSTOR HEADERS - 5	TAM-1	5/4/92	5/8/92	Task	5	01	
214	140068-TAM ERECT SAND/FILL - SCREW CONVEYOR - 2	TAM-1	4/16/92	4/17/92	Task	2	01	
215	140070 - TAM SET - UREA TANK - 2	TAM-2	4/16/92	4/17/92	Task	2	02	
216	140072-TAM ROUGH SET - FURN SIDEWALL UPPER - 3	TAM-1	5/11/92	5/13/92	Task	3	01	
217	140074-TAM ROUGH SET - FURN FW UPPER - 3	TAM-1	5/14/92	5/18/92	Task	3	01	
218	140076-TAM GROUND ASSEMBLE - FURN DW - 20	TAM-3	5/18/92	6/15/92	Milestone	20	03	
219	140078-TAM ROUGH SET - FURN RW UPPER - 2	TAM-2	5/19/92	5/20/92	Task	2	02	
220	140080-TAM ROUGH SET - AIR HEATER HOPPER - 2	TAM-2	5/21/92	5/22/92	Task	2	02	
221	140082-TAM PART ERECT - UPPER FURN SIDEWALL - 3	TAM-2	5/21/92	5/26/92	Task	3	02	
222	140082A-TAM COMP ERECT - UPPER FURN SIDEWALL - 3	TAM-2	5/27/92	5/29/92	Task	3	02	
223	140084-TAM AIR HEATER SUPPORT STEEL - 3	TAM-2	5/26/92	5/28/92	Task	3	02	
224	140086-TAM FURN SW WELD UPPER - 9	TAM-2	5/27/92	6/8/92	Task	9	02	
225	140088-TAM ROUGH SET - STEAM COIL AIR HEATER - 2	TAM-2	5/29/92	6/1/92	Task	2	02	
226	140090-TAM ERECT - UPPER FURN FW - 6	TAM-2	6/1/92	6/8/92	Task	6	02	
227	140092-TAM ROUGH SET - PRIMARY AIR HEATER - 1	TAM-2	6/2/92	6/2/92	Task	1	02	
228	140094-TAM ERECT - STEAM COIL AIR HEATER - 4	TAM-2	6/12/92	6/17/92	Task	4	02	
229	140096-TAM ERECT PRIMARY AIR HEATER - 4	TAM-2	6/3/92	6/8/92	Task	4	02	
230	140098-TAM ROUGH SET - SECONDARY AIR HEATERS - 1	TAM-2	6/3/92	6/3/92	Task	1	02	
231	140100-TAM ROUGH SET DUCT - ECON TO AH - 2	TAM-2	6/4/92	6/5/92	Task	2	02	
232	140102-TAM ROUGH SET EXPANSION JOINT - 3	TAM-2	6/4/92	6/8/92	Task	3	02	

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233	140104-TAM INSTALL - ECONOMIZER SUPPORT STEEL - 3	TAM-2	6/8/92	6/10/92	Task	3	02	
234	140106-TAM ERECT - UPPER FURN RW - 7	TAM-2	6/9/92	6/17/92	Task	7	02	
235	140108-TAM ERECT - SECONDARY AIR HEATER - 4	TAM-2	6/9/92	6/12/92	Task	4	02	
236	140110-TAM ERECT - ECONOMIZER - 3	TAM-2	6/11/92	6/15/92	Task	3	02	
237	140112-TAM ERECT - AIR HEATER HOPPER - 6	TAM-2	6/15/92	6/22/92	Task	6	02	
238	140114-TAM ROUGH SET DUCT - SH TO ECONOMIZER - 2	TAM-2	6/16/92	6/17/92	Task	2	02	
239	140116-TAM ERECT DUCT - ECON TO AH - 6	TAM-2	6/16/92	6/23/92	Task	6	02	
240	140118-TAM ERECT - EXPANSION JOINT - 6	TAM-2	6/16/92	6/23/92	Task	6	02	
241	140120-TAM FEEDWATER VALVE & PIPING - 7	TAM-2	6/16/92	6/24/92	Task	7	02	
242	140122-TAM ERECT - 6" FEEDWATER PIPE - 4	TAM-2	6/16/92	6/19/92	Task	4	02	
243	140124-TAM ROUGH SET SOOT BLOWER PIPING - 2	TAM-2	6/16/92	6/17/92	Task	2	02	
244	140126-TAM ROUGH SET - GAS GUN PURGE AIR - 1	TAM-2	5/28/92	5/28/92	Task	1	02	
245	140128-TAM ROUGH SET - FURN LW LOWER - 3	TAM-2	6/9/92	6/11/92	Task	3	02	
246	140130-TAM ERECT BUCKSTAYS - 70	TAM-2	6/18/92	9/25/92	Task	70	02	
247	140132-TAM ROUGH SET - SAND PIPING TO COAL FEEDER - 2	TAM-2	5/29/92	6/1/92	Task	2	02	
248	140134-TAM WELD UPPER FURN RW - 8	TAM-2	6/18/92	6/29/92	Task	8	02	
249	140136-TAM ROUGH SET - RETRACTABLE SOOT BLOWER - 2	TAM-2	6/18/92	6/19/92	Task	2	02	
250	140138-TAM ROUGH SET - HEAT RECOVERY AREA BUCKSTAYS - 3	TAM-2	6/22/92	6/24/92	Task	3	02	
251	140140-TAM ERECT - SAND PIPING TO COAL FEEDER - 8	TAM-2	6/2/92	6/11/92	Task	8	02	
252	140142-TAM ERECT - LOWER FURN FW -	TAM-2	6/12/92	6/22/92	Task	7	02	
253	140144-TAM ROUGH SET - FURN SW LOWER - 4	TAM-2	6/9/92	6/12/92	Task	4	02	
254	140146-TAM INSTALL - CYCLONE SUPPORT STEEL - 4	TAM-2	6/22/92	6/25/92	Task	4	02	
255	140148-TAM SOOT BLOWERS - ROTARY - 4	TAM-2	6/16/92	6/19/92	Task	4	02	
256	140150-TAM LIMESTONE SLIDE GATE - 1	TAM-2	6/3/92	6/3/92	Task	1	02	
257	140152-TAM LIMESTONE LINE - FEEDER TO BIN - 6	TAM-2	6/3/92	6/10/92	Task	6	02	
258	140154-TAM LIMESTONE ROTARY AIR LOCK - 2	TAM-2	6/4/92	6/5/92	Task	2	02	
259	140156-TAM ROUGH SET - INT SH OUTLET HEADER - 2	TAM-2	6/25/92	6/26/92	Task	2	02	
260	140158-TAM LIMESTONE CHUTES - 4	TAM-2	6/8/92	6/11/92	Task	4	02	
261	140160-TAM ERECT - LOWER FURN SW - 6	TAM-2	6/15/92	6/22/92	Task	6	02	

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262	140162-TAM ROUGH SET - DESUPERHEATER HDR - 1	TAM-2	6/29/92	6/29/92	Task	1	02	
263	140164-TAM HEAT RECOVERY AREA TOP GRID STEEL - 5	TAM-2	6/30/92	7/7/92	Task	5	02	
264	140166-TAM ROUGH SET - LOWER FURN RW - 3	TAM-2	6/30/92	7/2/92	Task	3	02	
265	140168-TAM ERECT - DESUPERHEATER HEADER - 2	TAM-2	6/30/92	7/1/92	Task	2	02	
266	140170-TAM WELD - FURN FW MIDDLE TUBE - 7	TAM-2	6/23/92	7/1/92	Task	7	02	
267	140172-TAM LIMESTONE ROTARY BLOWER - 3	TAM-2	6/12/92	6/16/92	Task	3	02	
268	140174-TAM ERECT LOWER FURN RW - 7	TAM-2	7/6/92	7/14/92	Task	7	02	
269	140176-TAM WELD - FURN SW MIDDLE TUBE - 9	TAM-2	6/23/92	7/6/92	Task	9	02	
270	140178-TAM INSTALL SUPERHEAT BOILER HANGERS - 5	TAM-2	7/8/92	7/14/92	Task	5	02	
271	140180-TAM ROUGH SET - ASH CLASSIFIER - 2	TAM-2	3/23/92	3/24/92	Task	2	02	
272	140182-TAM WELD FURN RW MIDDLE TUBE - 7	TAM-2	7/15/92	7/23/92	Task	7	02	
273	140184-TAM ERECT - UPPER SH WALL RING HEADER - 3	TAM-2	7/15/92	7/17/92	Task	3	02	
274	140186-TAM ERECT - ASH CLASSIFIER - 6	TAM-2	3/25/92	4/1/92	Task	6	02	
275	140188-TAM ROUGH SET - ASH DUCT - 7	TAM-2	3/25/92	4/2/92	Task	7	02	
276	140190-TAM ERECT - FURN SW LOWER HDR - 4	TAM-2	7/7/92	7/10/92	Task	4	02	
277	140192-TAM ERECT - SH SIDE WALL PANELS - 4	TAM-2	7/20/92	7/23/92	Task	4	02	
278	140194-TAM ERECT - SH FRONT WALL PANEL - 3	TAM-2	7/24/92	7/28/92	Task	3	02	
279	140196-TAM UREA RECIRC PUMP - 2	TAM-2	7/2/92	7/6/92	Task	2	02	
280	140198-TAM UREA CHEMICAL INJECTION SYSTEM - 3	TAM-2	7/2/92	7/7/92	Task	3	02	
281	140200-TAM UREA DISTRIBUTION MODULES - 5	TAM-2	7/2/92	7/9/92	Task	5	02	
282	140202-TAM FURNISH SW TUBE WELD LOWER TO HDR - 6	TAM-2	7/13/92	7/20/92	Task	6	02	
283	140204-TAM ROUGH ERECT DUCT - PRI AIR FANS TO AH - 5	TAM-2	7/7/92	7/13/92	Task	5	02	
284	140206-TAM ASH COOLING SCREW CONVEYOR - 6	TAM-2	7/2/92	7/10/92	Task	6	02	
285	140208-TAM ERECT - ASH DUCT - 10	TAM-2	4/3/92	4/16/92	Task	10	02	
286	140210-TAM ERECT - SH REAR WALL PANEL - 4	TAM-2	7/29/92	8/3/92	Task	4	02	
287	140212-TAM UREA INTERCONNECTING PIPING - 9	TAM-2	7/10/92	7/22/92	Task	9	02	
288	140214-TAM ROUGH ERECT DUCT - SEC AIR FAN TO AH - 4	TAM-2	7/14/92	7/17/92	Task	4	02	
289	140216-TAM ERECT - LOWER SH WALL RING HDR - 3	TAM-2	8/4/92	8/6/92	Task	3	02	
290	140218-TAM ERECT - INT SH OUTLET HEADER - 2	TAM-3	8/4/92	8/5/92	Milestone	2	03	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
291	140220-TAM ERECT - FLOOR PLENUM - 9	TAM-2	7/24/92	8/5/92	Task	9	02	
292	140222-TAM ERECT DUCT - SH TO ECON DUCT - 6	TAM-3	8/7/92	8/14/92	Milestone	6	03	
293	140224-TAM TUBE WELD 1.5 X .180 SH REAR PNL - 5	TAM-3	8/7/92	8/13/92	Milestone	5	03	
294	140226-TAM WELD SH MEMBRANE - 9	TAM-3	8/7/92	8/19/92	Milestone	9	03	
295	140228-TAM GROUND ASSEMBLE - PRIMARY SH ELEMENT - 15	TAM-3	7/16/92	8/5/92	Milestone	15	03	
296	140230-TAM GROUND ASSEMBLE - INTERM SH ELEMENTS - 3	TAM-3	7/16/92	7/20/92	Milestone	3	03	
297	140232-TAM ROUGH SET DAMPERS - 2	TAM-3	7/20/92	7/21/92	Milestone	2	03	
298	140234-TAM ROUGH SET - NON METAL AIR DUCTS EXP JOINTS - 4	TAM-3	7/20/92	7/23/92	Milestone	4	03	
299	140234-TAM ROUGH SET - NON METAL AIR DUCTS EXP JOINTS - 4	TAM-2	7/20/92	7/23/92	Task	4	02	
300	140236-TAM ERECT - ASH DUCT - 4	TAM-2	4/17/92	4/22/92	Task	4	02	
301	140238-TAM TUBE WELD 1.5 X .180 SH SIDE PNL - 8	TAM-3	8/7/92	8/18/92	Milestone	8	03	
302	140240-TAM FLUOSEAL DUCT - 4	TAM-3	7/23/92	7/28/92	Milestone	4	03	
303	140242-TAM ROUGH SET - SECONDARY AIR FAN - 4	TAM-3	7/24/92	7/29/92	Milestone	4	03	
304	140244-TAM TUBE WELD 1.5 X .180 SH SIDE PNL - 4	TAM-3	8/7/92	8/12/92	Milestone	4	03	
305	140246-TAM ERECT ROOF PANELS - 8	TAM-3	8/6/92	8/17/92	Milestone	8	03	
306	140248-TAM TUBE WELD 3.0 X .220 CS FLR PLENUM - 15	TAM-3	8/6/92	8/26/92	Milestone	15	03	
307	140250-TAM MISC INSTRUMENT PIPING - 28	TAM-3	7/28/92	9/3/92	Milestone	28	03	
308	140252-TAM ROUGH SET - LOOP SEAL EXPANSION JOINT - 2	TAM-3	7/29/92	7/30/92	Milestone	2	03	
309	140254-TAM ROUGH SET - SECONDARY AIR FAN DRIVE - 2	TAM-3	7/30/92	7/31/92	Milestone	2	03	
310	140256 - TAM ERECT - INTERM SH ELEMENTS - 4	TAM-3	8/20/92	8/25/92	Milestone	4	03	
311	140258-TAM ERECT - HEAT RECOVERY AREA BUCKSTAYS - 6	TAM-3	8/19/92	8/26/92	Milestone	6	03	
312	140260-TAM ERECT CYCLONE - 8	TAM-3	7/31/92	8/11/92	Milestone	8	03	
313	140262-TAM ROUGH SET - PRIMARY AIR FAN - 8	TAM-3	8/3/92	8/12/92	Milestone	8	03	
314	140264-TAM ERECT - SECONDARY AIR FAN - 20	TAM-3	8/3/92	8/28/92	Milestone	20	03	
315	140266-TAM WELD 2.25 X .180 INT SH ELEMENTS - 4	TAM-3	8/26/92	8/31/92	Milestone	4	03	
316	140268-TAM ROUGH SET - FURN DW - 2	TAM-3	8/18/92	8/19/92	Milestone	2	03	
317	140270-TAM WELD 3.0 X .220 CS ROOF TUBE - 11	TAM-3	8/18/92	9/1/92	Milestone	11	03	
318	140272-TAM ERECT - PRIMARY SH ELEMENTS - 5	TAM-3	8/27/92	9/2/92	Milestone	5	03	
319	140274-TAM ERECT - FURN DW LOPWER HDR - 3	TAM-3	8/20/92	8/24/92	Milestone	3	03	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
320	140276-TAM ROUGH SET - RISER PIPE - 5	TAM-3	8/20/92	8/26/92	Milestone	5	03	
321	140278-TAM ERECT - FIN IN/OUT HEADER - 2	TAM-3	9/1/92	9/2/92	Milestone	2	03	
322	140280-TAM INSTALL - CYCLONE OUTLET DUCT - 6	TAM-3	8/12/92	8/19/92	Milestone	6	03	
323	140282-TAM 5.5' DIA LOOP SEAL DOWNCOMER - 5	TAM-3	8/12/92	8/18/92	Milestone	5	03	
324	140284-TAM ERECT - PRIMARY AIR FAN - 28	TAM-3	8/13/92	9/22/92	Milestone	28	03	
325	140286-TAM ROUGH SET - PRIMARY AIR FAN DRIVE - 2	TAM-3	8/13/92	8/14/92	Milestone	2	03	
326	140288-TAM ERECT - SH LINK PIPE - 14	TAM-3	9/3/92	9/23/92	Milestone	14	03	
327	140290-TAM FURN DW LOWER WELD TO HDR - 7	TAM-3	8/25/92	9/2/92	Milestone	7	03	
328	140292-TAM WELD 2.25 X .180 PRI SH ELEMENTS - 17	TAM-3	9/3/92	9/28/92	Milestone	17	03	
329	140294-TAM ERECT - FINISHING SH ELEMENTS - 6	TAM-3	9/3/92	9/11/92	Milestone	6	03	
330	140296-TAM ERECT-CYCLONE INLET EXPANSION JOINT - 4	TAM-3	8/27/92	9/1/92	Milestone	4	03	
331	140298-TAM ERECT - FLUOSEAL DISCHARGE LEG - 8	TAM-3	8/27/92	9/8/92	Milestone	8	03	
332	140300-TAM LIMESTONE PNEUMATIC PIPE - 18	TAM-3	9/2/92	9/28/92	Milestone	18	03	
333	140302-TAM COAL CHUTES - 15	TAM-3	8/27/92	9/17/92	Milestone	15	03	
334	140304-TAM FURNACE MEMBRANE WELDING - 40	TAM-3	8/27/92	10/22/92	Milestone	40	03	
335	140306-TAM ERECT - DOWNCOMBER PIPE - 8	TAM-3	8/27/92	9/8/92	Milestone	8	03	
336	140308-TAM ERECT - RISER PIPE - 20	TAM-3	8/27/92	9/24/92	Milestone	20	03	
337	140310-TAM ROUGH SET - PENTHOUSE CASING - 2	TAM-3	8/27/92	8/28/92	Milestone	2	03	
338	140312-TAM ERECT LOOP SEAL EXPANSION JOINT - 4	TAM-3	8/19/92	8/24/92	Milestone	4	03	
339	140314-TAM CYCLONE OUTLET EXPANSION JOINT - 4	TAM-3	8/20/92	8/25/92	Milestone	4	03	
340	140316-TAM ERECT - DIVISION WALLS - 10	TAM-3	9/3/92	9/17/92	Milestone	10	03	
341	140318-TAM ERECT - SH ROOF PANEL - 2	TAM-3	9/14/92	9/15/92	Milestone	2	03	
342	140320-TAM WELD 2.25 X .180 FIN SH ELEMENTS - 12	TAM-3	9/14/92	9/29/92	Milestone	12	03	
343	140322-TAM ERECT - RETRACTABLE SOOT BLOWERS - 10	TAM-3	9/14/92	9/25/92	Milestone	10	03	
344	140324-TAM CRANE COMPLETE - 1	TAM-3	9/16/92	9/16/92	Milestone	1	03	
345	140326-TAM TUBE WELD 1.5 X .180 SH ROOF PNL - 5	TAM-3	9/16/92	9/22/92	Milestone	5	03	
346	140328-TAM WELD 12" SCH 80 X 106B DOWNCOMER - 8	TAM-3	9/9/92	9/18/92	Milestone	8	03	
347	140330-TAM DUCT - SEC AIR FAN TO AH - 20	TAM-3	8/31/92	9/28/92	Milestone	20	03	
348	140332-TAM ERECT - SECONDARY AIR FAN DRIVE - 3	TAM-3	8/31/92	9/2/92	Milestone	3	03	

listed in ~~activity number~~ activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
349	140334-TAM WELD 10" SCH 80 CS SH LINK PIPE - 13	TAM-3	9/24/92	10/12/92	Milestone	13	03	
350	140336-TAM ERECT - SOOT BLOWER PIPING - 26	TAM-3	9/28/92	11/2/92	Milestone	26	03	
351	140338-TAM WELD 10" SCH 80 X 106B DOWNCOMER - 5	TAM-3	9/21/92	9/25/92	Milestone	5	03	
352	140340-TAM EH HDR ENCLR CASING - 25	TAM-3	9/30/92	11/3/92	Milestone	25	03	
353	140342-TAM WELD 10" SCH 80 X 106B RISER - 18	TAM-3	9/25/92	10/20/92	Milestone	18	03	
354	140344-TAM WELD 8" SCH 80 X 106B DOWNCOMER - 4	TAM-3	9/28/92	10/1/92	Milestone	4	03	
355	140346-TAM ERECT DUCT - PRIMARY AIR FANS TO AH - 20	TAM-3	9/23/92	10/20/92	Milestone	20	03	
356	140348-TAM ERECT - PRIMARY AIR FAN DRIVE - 4	TAM-3	9/23/92	9/28/92	Milestone	4	03	
357	140350-TAM WELD 10" X 1.25 P11 SH LINK PIPE - 5	TAM-3	10/13/92	10/19/92	Milestone	5	03	
358	140352-TAM BEARING COOL WATER PIPING - 4	TAM-3	9/29/92	10/2/92	Milestone	4	03	
359	140354-TAM MISC TRIM PIPING - 40	TAM-3	10/20/92	12/15/92	Milestone	40	03	
360	140356-TAM WELD 8" SCH 80 X 106B RISER - 14	TAM-3	10/21/92	11/9/92	Milestone	14	03	
361	140358-TAM ERECT DUCT - SEC AIR AH TO BUSTLE - 15	TAM-3	10/23/92	11/12/92	Milestone	15	03	
362	140360-TAM GRIND INSIDE COMBUSTOR - 15	TAM-3	10/23/92	11/12/92	Milestone	15	03	
363	140362-TAM HYDRO TEST - SOOT BLOWER PIPING - 2	TAM-3	11/3/92	11/4/92	Milestone	2	03	
364	140364-TAM ERECT DUCT - COAL FD PURGE AIR - 15	TAM-3	5/29/92	6/18/92	Milestone	15	03	
365	140366-TAM 6" OFA NOZZLES - 6	TAM-3	11/13/92	11/20/92	Milestone	6	03	
366	140368-TAM FLOW ELEMENTS - 2	TAM-3	11/13/92	11/16/92	Milestone	2	03	
367	140370-TAM NON METAL AIR DUCTS EXPANSION JOINTS - 8	TAM-3	11/13/92	11/24/92	Milestone	8	03	
368	140372-TAM INSTALL UREA INJECTION NOZZLES - 4	TAM-3	11/13/92	11/18/92	Milestone	4	03	
369	140374-TAM UREA PIPING TO COMBUSTOR & CYCLONES - 12	TAM-3	11/19/92	12/7/92	Milestone	12	03	
370	140376-TAM ERECT - OFA DUCT BUSTLE TO BURNERS - 10	TAM-3	11/23/92	12/7/92	Milestone	10	03	
371	140378-TAM HYDROSTATIC TEST - 4	TAM-3	12/16/92	12/21/92	Milestone	4	03	
372	140380-TAM UREA SYSTEM COMPLETE - 1	TAM-3	12/8/92	12/8/92	Milestone	1	03	
373	140382-TAM ERECT DUCT - GAS GUN PURGE AIR - 6	TAM-3	12/8/92	12/15/92	Milestone	6	03	
374	140384-TAM ERECT - DAMPERS - 4	TAM-3	12/8/92	12/11/92	Milestone	4	03	
375	140386-TAM NON METAL AIR DUCTS EXPANSION JOINTS - 10	TAM-3	12/8/92	12/21/92	Milestone	10	03	
376	140388-TAM DAMPERS ACTUATORS - 5	TAM-3	12/14/92	12/18/92	Milestone	5	03	
377	140390-TAM INSTRUMENTATION / CONTROLS - 80	TAM-3	12/22/92	4/14/93	Milestone	80	03	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
378	140392-TAM PENTHOUSE CASING - 30	TAM-3	12/22/92	2/3/93	Milestone	30	03	
379	140394-TAM ACCESS DOORS/PORTS - 5	TAM-3	12/22/92	12/29/92	Milestone	5	03	
380	140398-TAM ERECT - BURNERS & PREPIPED RACKS - 12	TAM-3	12/16/92	1/4/93	Milestone	12	03	
381	140400-TAM AIR TEST - 4	TAM-3	12/30/92	1/5/93	Milestone	4	03	
382	140402-TAM INSULATION / LAGGING - 78	TAM-3	1/6/93	4/23/93	Milestone	78	03	
383	140406-TAM GAS & AIR PIPING - 15	TAM-3	1/5/93	1/25/93	Milestone	15	03	
384	140408-TAM GAS LANCES - 10	TAM-3	1/26/93	2/8/93	Milestone	10	03	
385	140410-TAM COMPLETE - 1	TAM-3	4/26/93	4/26/93	Milestone	1	03	
386	140412-TAM REFRACTORY CURE-OUT - 5	TAM-3	2/4/93	2/10/93	Milestone	5	03	
387	140414-TAM CHEMICAL CLEANING - 5	TAM-3	2/11/93	2/17/93	Milestone	5	03	
388	140416-TAM REFRACTORIZE FLUOSEAL - 5	TAM-3	1/28/93	2/3/93	Milestone	5	03	
389	140418-TAM REFRACTORIZE COMBUSTOR - 15	TAM-3	1/7/93	1/27/93	Milestone	15	03	
390	140420-TAM STUD SUPERHEATER - 10	TAM-3	11/30/92	12/11/92	Milestone	10	03	
391	140422-TAM METAL SPRAY - 10	TAM-3	12/22/92	1/6/93	Milestone	10	03	
392	140424-TAM REFRACTORIZE CYCLONE - 30	TAM-3	11/30/92	1/12/93	Milestone	30	03	
393	140426-TAM STUD MEMBRANE WALLS - 5	TAM-3	11/20/92	11/27/92	Milestone	5	03	
394	140428-TAM REFRACTORY MOBILIZATION - 5	TAM-3	11/13/92	11/19/92	Milestone	5	03	
395	140430-TAM DELIVER - CYCLONES - 02/14/92 PM - TO 140006	TAM-3	2/17/92	2/17/92	Milestone	0	03	
396	140432-TAM DELIVER - AIR HEATER TO PLENUM DUCT - 02/28/92 PM - TO 140010	TAM-1	3/2/92	3/2/92	Milestone	0	01	
397	140434-TAM DELIVER - FLUOSEAL - 03/02/92 PM - TO 140026	TAM-1	3/3/92	3/3/92	Milestone	0	01	
398	140436-TAM DELIVER - FURNACE LOWER HEADERS - 03/04/92 PM - TO 140018	TAM-1	3/5/92	3/5/92	Milestone	0	01	
399	140438-TAM DELIVER - FURNACE FLOOR TUBES - 03/05/92 PM - TO 140020	TAM-1	3/6/92	3/6/92	Milestone	0	01	
400	140440-TAM DELIVER - FURNACE BUCKSTAYS - 03/06/92 PM - TO 140024	TAM-1	3/9/92	3/9/92	Milestone	0	01	
401	140442-TAM DELIVER - FRAMING STEEL - 03/06/92 PM - TO 140022, 038, 046, 084, 104, 164	TAM-1	3/9/92	3/9/92	Milestone	0	01	
402	140442-TAM DELIVER - FRAMING STEEL - 03/06/92 PM - TO 140022, 038, 046, 084, 104, 164	TAM-1	3/9/92	3/9/92	Milestone	0	01	
403	140442-TAM DELIVER - FRAMING STEEL - PM 03/06/92	TAM-2	3/9/92	3/9/92	Milestone	0	02	
404	140444-TAM DELIVER - ASH CLASSIFIER - 03/09/92 - TO 140180	TAM-2	3/10/92	3/10/92	Milestone	0	02	
405	140446-TAM DELIVER - COAL FEEDERS - 03/12/92 PM - TO 140028	TAM-1	3/13/92	3/13/92	Milestone	0	01	
406	140448-TAM DELIVER - BURNERS & RACKS - 03/16/92 PM - TO 140036	TAM-1	3/17/92	3/17/92	Milestone	0	01	

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp
407	140450-TAM DELIVER - BURNER INJECTOR & RACKS - 03/16/92 PM - TO 140036	TAM-1	3/17/92	3/17/92	Milestone		0 01	
408	140452-TAM DELIVER - SUPPORTS & HANGERS - 03/16/92 PM - TO 140052	TAM-1	3/17/92	3/17/92	Milestone		0 01	
409	140452-TAM DELIVER SUPPORTS & HANGERS - PM 03/16/92	TAM-2	3/17/92	3/17/92	Milestone		0 02	
410	140454-TAM DELIVER STEAM DRUM - AM 03/26/92	TAM-1	3/26/92	3/26/92	Milestone		0 01	
411	140456-TAM DELIVER - AIR HEATER HOPPER - PM 03/27/92	TAM-2	3/30/92	3/30/92	Milestone		0 02	
412	140458-TAM DELIVER LIMESTONE FEEDERS - PM 04/02/92	TAM-3	4/3/92	4/3/92	Milestone		0 03	
413	140460-TAM DELIVER DUCT - SEC AIR AH TO BUSTLE - PM 04/08/92	TAM-1	4/9/92	4/9/92	Milestone		0 01	
414	140462-TAM DELIVER DUCT - COAL FD PURGE AIR - PM 04/10/92	TAM-1	4/13/92	4/13/92	Milestone		0 01	
415	140464-TAM DELIVER - SAND SCREW FEEDER - PM 04/13/92	TAM-1	4/14/92	4/14/92	Milestone		0 01	
416	140468-TAM DELIVER - SNCR SYSTEM TANK - PM 04/15/92	TAM-2	4/16/92	4/16/92	Milestone		0 02	
417	140470-TAM DELIVER - TEMPERING / PREHEAT COILS - PM 04/20/92	TAM-2	4/21/92	4/21/92	Milestone		0 02	
418	140472-TAM DELIVER - TUBES, FURNACE UPPER SW - PM 04/21/92	TAM-1	4/22/92	4/22/92	Milestone		0 01	
419	140474-TAM DELIVER - UPPER FW FURNACE TUBES - PM 04/24/92	TAM-1	4/27/92	4/27/92	Milestone		0 01	
420	140476-TAM DELIVER - UPPER RW FURNACE TUBES - PM 04/24/92	TAM-2	4/25/92	4/25/92	Milestone		0 02	
421	140478-TAM DELIVER - AIRHEATER - PM 05/01/92	TAM-2	5/4/92	5/4/92	Milestone		0 02	
422	140478-TAM DELIVER AIR HEATER - PM 05/01/92	TAM-2	5/4/92	5/4/92	Milestone		0 02	
423	140482-TAM DELIVER - FURNACE ROOF TUBES - PM 05/04/92	TAM-3	5/5/92	5/5/92	Milestone		0 03	
424	140484-TAM DELIVER ECONOMIZER TO AH - PM 05/14/92	TAM-2	5/15/92	5/15/92	Milestone		0 02	
425	140486-TAM DELIVER - SH DUCT TO ECON - PM 05/26/92	TAM-2	5/27/92	5/27/92	Milestone		0 02	
426	140488-TAM DELIVER DUCT - GAS GUN PURGE AIR - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone		0 02	
427	140490-TAM DELIVER - SW LOWER FURNACE TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone		0 02	
428	140492-TAM DELIVER - FW FURNACE LOWER TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone		0 02	
429	140494-TAM DELIVER - RW LOWER FURNACE TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone		0 02	
430	140496-TAM DELIVER - RETRACTABLE SOOT BLOWERS - PM 05/28/92	TAM-2	5/29/92	5/29/92	Milestone		0 02	
431	140498-TAM DELIVER - DIVISION WALL TUBES - PM 06/01/92	TAM-3	6/2/92	6/2/92	Milestone		0 03	
432	140500-TAM DELIVER SOOT BLOWER CONTROLS - 06/01/92	TAM-3	6/2/92	6/2/92	Milestone		0 03	
433	140502-TAM DELIVER SOOTBLOWER ROTARY - PM 06/01/92	TAM-2	6/2/92	6/2/92	Milestone		0 02	
434	140504-TAM DELIVER - SUPERHEATER BUCK STAYS - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone		0 03	
435	140504-TAM DELIVER - SUPERHEATER BUCKSTAYS - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone		0 02	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
436	140504-TAM DELIVER - SUPERHEATER BUCKSTAYS - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone	0	02	
437	140506-TAM DELIVER - SECONDARY FAN W/ DRIVE - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone	0	03	
438	140508-TAM DELIVER - PRIMARY FAN W/ DRIVE - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone	0	03	
439	140510-TAM DELIVER - PNEUMATIC LIMESTONE SYSTEM - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone	0	02	
440	140514-TAM DELIVER - SUPERHEATER HEADERS - PM 06/05/92	TAM-2	6/8/92	6/8/92	Milestone	0	02	
441	140516-TAM DELIVER - SUPERHEATER ENCLOSURE HEADERS - PM 06/08/92	TAM-2	6/9/92	6/9/92	Milestone	0	02	
442	140518-TAM DELIVER - SUPERHEATER ENCLOSURE HEADERS - PM 06/08/92	TAM-2	6/9/92	6/9/92	Milestone	0	02	
443	140518-TAM DELIVER - SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-3	6/12/92	6/12/92	Milestone	0	03	
444	140518-TAM DELIVER - SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-2	6/12/92	6/12/92	Milestone	0	02	
445	140518-TAM DELIVER SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-2	6/12/92	6/12/92	Task	0	02	
446	140520-TAM DELIVERY - TRIM PIPING - PM 07/01/92	TAM-3	7/2/92	7/2/92	Milestone	0	03	
447	140522-TAM DELIVERY - SNCR SYSTEM PUMPS, MODULERS - PM 07/01/92	TAM-2	7/2/92	7/2/92	Milestone	0	02	
448	140522-TAM DELIVERY - SNCR SYSTEM PUMPS, MODULERS - PM 07/01/92	TAM-3	7/2/92	7/2/92	Milestone	0	03	
449	140524-TAM DELIVER - ASH COOLING SCREWS - PM 07/01/92	TAM-2	7/2/92	7/2/92	Task	0	02	
450	140526-TAM DELIVER - PRI AIR FANS TO AH - PM 07/06/92	TAM-2	7/7/92	7/7/92	Milestone	0	02	
451	140528-TAM DELIVER DUCT - SECONDARY AIR FAN TO AH - PM 07/10/92	TAM-2	7/13/92	7/13/92	Milestone	0	02	
452	140530-TAM DELIVER - SUPERHEATER, PRIM & INT ELEMENTS - PM 07/15/92	TAM-3	7/16/92	7/16/92	Milestone	0	03	
453	140532-TAM DELIVER - NON METAL AIR DUCT EXP JOINT - PM 07/16/92	TAM-3	7/17/92	7/17/92	Milestone	0	03	
454	140534-TAM DELIVER - PENTHOUSE - PM 07/17/92	TAM-3	7/20/92	7/20/92	Milestone	0	03	
455	140536-TAM DELIVER - FLUOSEAL DUCT - PM 07/22/92	TAM-3	7/23/92	7/23/92	Milestone	0	03	
456	140538-TAM DELIVER INSTRUMENTS & CONTROLS - PM 07/27/92	TAM-3	7/28/92	7/28/92	Milestone	0	03	
457	140540-TAM DELIVER - SUPERHEATER, FIN ELEMENTS - PM 08/07/92	TAM-3	8/10/92	8/10/92	Milestone	0	03	
458	140542-TAM DELIVER - CYCLONE OUTLET DUCT - PM 08/11/92	TAM-3	8/12/92	8/12/92	Milestone	0	03	
459	170001-IMC IMC - SET ACID TANK - 1	IMC-4	6/15/92	6/15/92	Milestone	1	04	
460	170002-IMC IMC - COMP SET AND PIPE CHEM / ELEC. EQUIPMENT - 5	IMC-4	6/23/92	6/29/92	Milestone	5	04	
461	170002-IMC IMC - PART SET AND PIPE CHEM / ELEC. EQUIPMENT - 5	IMC-4	6/16/92	6/22/92	Milestone	5	04	
462	180001-DFIE DFIE - SET MAJOR ELECT. EQUIPMENT - 1	DFIE-4	7/2/92	7/2/92	Milestone	1	04	
463	180002-DFIE DFIE - COMP ELECTRICAL - 10	DFIE-4	7/13/92	7/24/92	Task	10	04	
464	180002-DFIE DFIE - PART ELECTRICAL - 0	DFIE-4	7/13/92	7/13/92	Task	0	04	

	activity	sub title	earliest start	earliest finish	type	days	s #	comp
465	190005-QUAL QUALITY - PART ELECT MACHINERY HOOK-UP - 0	QUAL-4	7/13/92	7/13/92	Task	0	04	
466	190005A-QUAL QUALITY - COMP ELECT MACHINERY HOOK-UP - 10	QUAL-4	7/13/92	7/24/92	Task	10	04	
467	FR 140036-TAM ROUGH SET-BURNERS & PREPIPE RK-SHT #01 - PM 04/03/92	TAM-3	4/6/92	4/6/92	Milestone	0	03	
468	FROM 140168 - TAM ERECT - DESUPERHEATER HEADER - PM 07/01/92 - SHT #02	TAM-3	7/2/92	7/2/92	Milestone	0	03	
469	T/R TO 04/06/92	FAI-5	4/6/92	4/6/92	Task	0	05	
470	T/R TO 07/07/92 FOR START OF SCH INT MASONRY	4	7/7/92	7/7/92	Milestone	0	04	
471	T/R TO AM 01/11/93	TAM-5	1/11/93	1/11/93	Task	0	05	
472	T/R TO AM 05/04/92	TAM-5	5/4/92	5/4/92	Task	0	05	
473	T/R TO AM 06/02/92	TAM-5	6/2/92	6/2/92	Task	0	05	
474	T/R TO AM 07/06/92	TAM-5	7/6/92	7/6/92	Task	0	05	
475	T/R TO AM 07/07/92	TAM-5	7/7/92	7/7/92	Task	0	05	
476	T/R TO AM 08/24/92	TAM-5	8/24/92	8/24/92	Task	0	05	
477	T/R TO IMC START SETTING ACID TANK - AM 06/15/92	IMC-4	6/15/92	6/15/92	Milestone	0	04	
478	T/R TO JUNE 23, 1992	VAN-4	6/23/92	6/23/92	Milestone	0	04	
479	T/R TO START INSTALL EXTERIOR WINDOWS EAST ELEVATION - 10/05/92	ABP-4	10/5/92	10/5/92	Milestone	0	04	
480	T/R TO START INTERIOR BUILDING CAULKING & SEALING - 07/13/92	WES-4	7/13/92	7/13/92	Milestone	0	04	
481	T/R TO START OF ALMET ERECT STRUCT STEEL - 01/06/92	ALMET-1	1/6/92	1/6/92	Task	0	01	x
482	T/R TO START OF GEC GENERAL ELECTRIC MOBILIZATION - 07/07/92	GEC-4	7/7/92	7/7/92	Milestone	0	04	
483	T/R TO START OF NORTH ELEVATION MASONRY 851 TO 967 - 09/03/92	SCH-4	9/3/92	9/3/92	Milestone	0	04	
484	T/R TO START OF ROOFING MOBILIZATION - 10/05/92	CEI-4	10/5/92	10/5/92	Milestone	0	04	
485	T/R TO START OF SILO FILL AREA SPRINKLER PIPING - 08/03/92	MOR-5	8/3/92	8/3/92	Task	0	05	
486	T/R TO START OF THERMAL - DYNAMIC MOBILIZATION - 06/22/92	THE-5	6/22/92	6/22/92	Task	0	05	
487	T/R TO START OF ZACK COMPANY MOBILIZATION - 07/13/92	ZAC-4	7/13/92	7/13/92	Milestone	0	04	
488	T/R TO TAMPELLA START MOBILIZATION - AM 03/02/92	TAM-1	3/2/92	3/2/92	Milestone	0	01	x

Ralph J. Stephenson, P. E.
Consulting Engineer

June 26, 1992

To: Robert Nestle - MSU project manager
Richard Wever - MSU construction superintendent
Jim Simons - MSU project representative

From: Ralph J. Stephenson, P. E.

Re: Immediate future planning and scheduling agenda
Michigan State University
T. B. Simon Power Plant Unit 4 Addition
East Lansing, Michigan

Over the past few weeks considerable study, review, and analysis has been made of the current planning and scheduling for the Power Plant. This has included the planning and scheduling material issued to date, the process of monitoring and updating, and a trip by me to the Tampella Power office and plant in Williamsport, Pennsylvania. This trip was considered desirable by the Michigan State physical plant staff, and had the concurrence of the Alberici/Clark project staff and top management.

At the Tampella office I discussed updating and reissue of the boiler installation plan of work and schedule with the Tampella and the Fuel Economy executive and project staff members. All agreed there was a need to reissue the plan and schedule. An updating prepared by Fuel Economy was given to me on June 9, 1992 by Tampella for my review. This issue was labeled ms6c-06/05/92 and was identified by Tampella as Prima Vera run #88, report date of June 9, 1992, and data date of February 1, 1992.

As we proceeded with the analysis of this network we found the information was of such nature that it was desirable for Tampella and Fuel Economy to further update the material.

This later update resulted in an issue ms6c-06/18/92, identified as the Prima Vera run, having a report date of June 18, 1992, run number #116, data date of June 12, 1992.

Continued analysis of the material from Tampella showed it would be advisable to continue the planning work for the boiler installation jointly with Michigan State University, Tampella and Alberici Clark. Michigan State was to take the lead in preparing the plan from contractor input and in close conjunction with the general project manager, and those contractors who are to do the work.

In accordance with this decision, I met with Tampella's field superintendent, Mr. Pete Theis on Wednesday, June 24, 1992 at the site. We discussed the project planning approaches best suited to the current needs. This lead to beginning the boiler installation plan updating process by using the current issue ms6c-06/18/92 as an activity laundry list and drafting a logic plan from this with direct managerial input to the process by Tampella. The updating is being labeled Issue #04, dated June 24, 1992. It will be used to generate data runs as needed and as desired by Tampella, Alberici/Clark, Fuel Economy, Michigan State University and others affected and involved.

Ralph J. Stephenson, P. E.
Consulting Engineer

June 26, 1992

I shall continue this planning process with Mr. Simons, Mr. Theis, and the Alberici/Clark project personnel as they and the owner desire and direct. Our next meeting will be on Monday, June 29, 1992 at the job site. Mr. Theis and I will attempt to complete the preliminary draft of the update for full review and near future distribution to the project team.

The boiler installation is of course only one of many job element plans that must be updated. To date none of the other design/fabrication/install (dfi) or A/C contractor plans or schedules have been updated since the early runs noted below were prepared and issued.

- A/C Prima Vera run #23, report date January 27, 1992, data date November 4, 1991, which included the following contractors. The series numbers are activity numbers assigned by A/C.

050000 series - ZAC work *WES (cabling)*
070000 series - ~~WEX~~ work *Hollow metal*
080000 series - ~~VAN~~ work

- A/C Prima Vera run #39, report date April 26, 1992, data date November 4, 1991, which included the following contractors. The series numbers are activity numbers assigned by A/C.

000000 series - mainly Almet work
010000 series - GEC work
020000 series - Alberici/Clark work *Shallen ? missing*
030000 series - ~~SCH~~ work
040000 series - GJOH work *roofing*
060000 series - ~~CEI~~ work
090000 series - ~~ESS~~ work *hardware*
100000 series - ~~ABP~~ work *windows*
110000 series - ~~ALL & GMID~~ work *elevator*
120000 series - ~~DOV~~ work
130000 series - ~~FAI, THE, and MOR~~ work
160000 series - DUV work
170000 - IMC work
180000 - QEDF work (?)
190000 - QAL work (?)

- A/C Prima Vera run #29 and 30, report dates February 22, 1992 and February 27, 1992 respectively, data date November 4, 1992, which included the following contractors. The series numbers are activity numbers assigned by A/C.

140000 series - TAM work ✓

- Others not covered by the above.

Ralph J. Stephenson, P. E.
Consulting Engineer

June 26, 1992

Fabric Filter Building?
Distributed Control Systems - if applicable?
Cooling Tower?

The above list may not be complete nor totally accurate, but it represents those contractor plans which have been in use since they were issued as well as some that are yet to be prepared.

We will need updated information from all dfi contractors and from contractors whose contracts are directly with Alberici/Clark. I suggest Mr. Simon and I address the method of collecting the needed data early in our meeting on Monday, June 29, 1992. Alberici/Clark should be involved since they are an integral part of the group developing a comprehensive and accurate plan of work for the total project.

During the data gathering process, network models for each of the individual contractors will be prepared and connected to each other at interface points so as to provide a complete picture of the work plan needed for the job. The modeling process should be done with the full participation of those actually responsible for the work.

A few key points should be emphasized as this work is continued.

1. The planning system to be used will be a precedence network model using end to start activities. This process will provide the logic plan of work, the early and late starts, and the early and late finishes. The total float time and other conventional network data will be available as may be needed from time to time.

Individual contractors can convert this network model format to other forms of software models such as Prima Vera, if they wish. The conversion will be their choice.

2. The data used to build the models must be provided to the owner by the contractors responsible for the work. If a subcontract is with a prime contractor or with the general project manager, the data can be furnished through the prime or the general project manager. However it is to be stressed that the updated network model must result from contractor input and be a model of their work.

3. The project will be monitored from the model diagram produced in the process described above.

4. Scheduling of the work, which consists of locking activities into specific start and finish points, will be the responsibility of those contractors managing and doing the work.

5. Updating of the network model for the full project, or for portions as required, will be done as deemed necessary by those involved in the work and Michigan State University.

6. Designation of the network issue will follow a numerical sequence and the date of the major planning efforts made during the issue. The issue and date designation will be designed to avoid reference confusion.

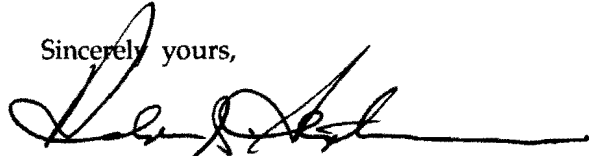
Ralph J. Stephenson, P. E.
Consulting Engineer

June 26, 1992

* * * * *

I'm looking forward to continuing the planning work on the project with you and all dfi and prime contractors just as quickly and expeditiously as possible. We have considerable data already available. With full cooperation by all involved the project plans should be completed in the near future.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Ralph J. Stephenson', with a long horizontal flourish extending to the right.

Ralph J. Stephenson, P. E.

• Terry

1. msu pp #4 - tam conference - d?

- msu pp #4 - tam conference
- Date - Tuesday, June 9, 1992
- + Location - TAM plant, Williamsport, Pennsylvania
 - Tappella Power Corporation
 - 2600 Reach Road
 - P. O. Box 3308
 - Williamsport, PA 17701-0308
 - Telephone - 717 327 3209
 - Fax - 717 327 3121

+ Those attending

- Paul Blanchet - TAM Manager of Projects - in meetings part time
- Dean Ely - TAM Project Manager
- Michael A. Fredo - TAM Assistant Project Manager
- Pete Theis - TAM Senior Field Engineer
- Tom Jorris - FEC Vice President *Senior - Project Manager*
- Jack ~~Desmor~~ - FEC Site Engineer
- Ralph J. Stephenson - MSU consultant

Dismore + Actions taken

- Reviewed desired agendas for meetings
- Discussed project plans and schedules currently in use
- Reviewed current status of TAM project deliveries
- Reviewed current status of TAM/FEC field work
- Discussed distribution of project communications as they relate to TAM/FEC planning and scheduling
- Discussed updating of current network models

+ Job plans and schedules currently in use

- + It was generally agreed that the material listed below collectively represents the current base line planning and scheduling information from which the project is being measured. There is not general agreement that the measurements should actually be made from the material listed below. However all agreed that there are no other issued documents available by which job progress can be measured by msu. They further agreed that TAM and FEC are no longer following the plans and schedules listed below.
 - TAM/FEC computer run #26
 - A/C computer run 29/30 - derived from TAM/FEC computer run #26
 - MSU 5 - FEC name for TAM/FEC computer run #27
 - msu/rjs issue #2a, dated ? - derived from A/C computer run 29/30

*Revin MS64
4/5/82
to MS6C
6/5/82*

+ From 10:00 am to 12:00

- Mr. Fredo, TAM Assistant Project Manager, met me and drove me to the plant.
- Set up in conference room.
- + Was given good tour of TAM main offices and plant
 - Tour conducted by Mr. Fredo, Mr. Frank Mazzula, CAD Manager, and Mr. ?, Plant Manager
 - Visited CAD facilities - 24 work stations
 - Visited plant - Very up to date, highly automated tube and table lines.
 - Production operations appeared slow during tour. However this could be due to a variety of reasons that are of an internal nature, and not part of my assignment.
- + Out to lunch with those attending meetings
 - + Discussed variety of subjects
 - My purpose in being there
 - What msu wished me to accomplish by my visit
 - Afternoon agenda
 - What was needed from TAM/FEC to satisfy msu needs

+ From 1:30 pm to about 4:00 pm

- + rjs established as the objectives of his trip the following:
 - To receive from TAM an updated delivery schedule
 - To receive from TAM an updated computer run showing activities, activity numbers, estimated durations and predecessors and successors.
- + Considerable discussion from TAM and FEC on the importance of impacts on their work.
 - I explained that I was not able to discuss their impact problems since I had no authentic knowledge of this subject, and that I had to concentrate on msu's and my basic objectives for this session as noted above. These dealt with the issuance of an updated delivery schedule and an updated network model showing TAM/FEC work.
- + FEC had provided TAM with a bar chart of early starts and early finishes derived from a predecessor, successor list prepared by FEC.
 - FEC called this run "ms6u"
 - I requested that TAM/FEC use an identification system that did not change each time a new computer run was made. (current run #'s, and dates of the run change on successive runs, even of identical data.

- FEC agreed that the p/s (predecessor/successor) run under discussion today would be called "ms6u - 06/05/92".
- FEC had run a bar chart of issue "ms6u - 06/05/92" showed FEC activity numbers, activity descriptions, total float, and early starts and finishes graphically charted on a time scale.
- FEC had also made a run of "ms6u - 06/05/92" showing the FEC activity numbers, activity descriptions, the durations?, early starts, early finishes, late starts, late starts, and total float time?.
- I was given copies of the "ms6u - 06/05/92" p/s run, the bar chart, and the arrayed activity data run.
- There was considerable discussion among the FEC/TAM group about whether or not this issue ms6u-06/05/92 run actually should be considered an issued set of job management data. I told them that if they wished I would mark in large letters on any translations (network diagrams, data runs, or other) that the issue was preliminary and for review and discussion only. I added, however that this issue could not be officially accepted and used by me, but had to go through official channels for it to see official use.
- I explained to the group that with this information I would update my graphic network models to confirm the validity of the logic as an updated network model. They generally agreed this would be ok. However it was understood that the network must still be formally issued at some point in the near future.
- + I called Mr. Wever and Mr. Simons of msu at 4:00 pm.
 - All attending were invited to stay for the conversation - they stayed
- + Covered following points with Mr. Wever and Mr. Simons
 - + That we were maintaining the objective of the meeting as being
 - To receive from TAM an updated delivery schedule
 - To receive from TAM an updated computer run showing activities, activity numbers, estimated durations and predecessors and successors.
 - That to date we had a new issue ms6u-06/05/92 that was available from TAM, and could be used for review and comment only.
 - That I was satisfied the material was what was desired from TAM, but that I still had to validate the material to determine if it was an updated plan of field action to be followed.
 - Mr. Wever and Mr. Simons said they were interested only in obtaining an action plan of work, and that any discussion of

Impacts were beyond the scope of my assignment on this trip.

- I agreed and pointed out that the validity of the issue ms6u-06/05/92 plan as a plan of proposed field action could only be determined after some additional investigation and study by me. They agreed this should be done if I felt it appropriate.
- Agreed to call Mr. Simons and Mr. Wever to give them an updated report tomorrow.

+ From 4:15 pm to about 6:30 pm

- Concluded conversations with those attending and FEC people left for the airport.
- + Worked with Mr. Pete Theis on following
 - Updated file on actual and scheduled delivery dates of TAM equipment.
 - Printed updated file on actual and scheduled TAM delivery dates for Mr. Theis and me.
- + Monitored sheet #01, issue 2a network model using input from Mr. Theis.
 - Removed completed activities from network to begin work on updating.
- On the first activity analyzed found some difficulties in locating predecessors. Decided to hold updating for further discussion.

	activity	es tam run #26	uc	act start	act fin	status as of 6/3/92	tamp/fec activity #	es - msu ac iss #2a	notes
1	080005-VAN PART DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 0							6/23/92	
2	080005A-VAN COMP DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 5							6/23/92	
3	090005-ESS DELIVER HARDWARE CHEM / ELEC BUILDING - 5							6/23/92	
4	119000-ALL DELIVER LOUVERS CHEM/ELEC. BUILDING - 5							6/23/92	
5	130005-FAI DELIVER COAL CONVEYOR EQUIPMENT - 15							4/6/92	
6	130015-FAI COMP DELIVER TRIPPER ROOM ROOF STEEL - 5							5/18/92	
7	130015-FAI PART DELIVER TRIPPER ROOM ROOF STEEL - 10							5/4/92	
8	130025-FAI DELIVER NEW BUNKER FEED BELT CONVEYOR - 2-15/E-F - 19							6/2/92	
9	130035-FAI DELIVER BUNKER PURGE CONVEYOR - 10-15/E-F - 15							7/6/92	
10	130045-FAI DELIVER EXISTING PURGE CONVEYOR DISCHARGE - 15							7/27/92	
11	140466-TAM DELIVER - UPPER FURNACE HEADER			4/23/92	5/22/92				not in tam run - added in a/c status
12	140430-TAM DELIVER - CYCLONES - 02/14/92 PM - TO 140006	2/14/92		3/18/92	3/18/92		236	2/17/92	
13	140432-TAM DELIVER - AIR HEATER TO PLENUM DUCT - 02/28/92 PM	2/28/92	x	6/8/92			259	3/2/92	6/22
14	140434-TAM DELIVER - FLUOSEAL - 03/02/92 PM	3/2/92		3/18/92	3/18/92		227	3/3/92	
15	140436-TAM DELIVER - FURNACE LOWER HEADERS - 03/04/92 PM - TO 140018	3/4/92		4/7/92	4/7/92		203	3/5/92	
16	140438-TAM DELIVER - FURNACE FLOOR TUBES - 03/05/92 PM - TO 140020	3/5/92		4/7/92	4/7/92		214	3/6/92	
17	140440-TAM DELIVER - FURNACE BUCKSTAYS - 03/06/92 PM - TO 140024	3/6/92		3/23/92	3/23/92		219	3/9/92	
18	140442-TAM DELIVER - FRAMING STEEL - 03/06/92 PM	3/6/92		3/13/92	3/13/92		225	3/9/92	
19	140444-TAM DELIVER - ASH CLASSIFIER - 03/09/92 - TO 140160	3/9/92	x				222	3/10/92	6/24 7/15
20	140446-TAM DELIVER - COAL FEEDERS - 03/12/92 PM - TO 140026	3/12/92		4/9/92	4/13/92		235	3/13/92	
21	140448-TAM DELIVER - BURNERS & RACKS - 03/16/92 PM - TO 140036	3/16/92	x				223	3/17/92	7/30
22	140450-TAM DELIVER - BURNER INJECTOR & RACKS - 03/16/92 PM	3/16/92	x				234	3/17/92	7/1
23	140452-TAM DELIVER - SUPPORTS & HANGERS - 03/16/92 PM	3/16/92		3/26/92	3/26/92		220	3/17/92	
24	140454-TAM DELIVER STEAM DRUM - AM 03/26/92	3/25/92		4/1/92	4/1/92		201	3/26/92	
25	140456-TAM DELIVER - AIR HEATER HOPPER - PM 03/27/92	3/27/92		3/19/92	3/19/92		238	3/30/92	
26	140458-TAM DELIVER LIMESTONE FEEDERS - PM 04/02/92	4/2/92		4/9/92	4/13/92		236	4/3/92	
27	140460-TAM DELIVER DUCT - SEC AIR AH TO BUSTLE - PM 04/08/92	4/8/92	x				250	4/9/92	6/22
28	140462-TAM DELIVER DUCT - COAL FD PURGE AIR - PM 04/10/92	4/10/92	x				251	4/13/92	6/30
29	140464-TAM DELIVER - SAND SCREW FEEDER - PM 04/13/92	4/13/92		4/30/92	4/30/92		244	4/14/92	
30	140468-TAM DELIVER - SNCR SYSTEM TANK - PM 04/15/92	4/15/92	x	6/1/92			245	4/16/92	6/1
31	140470-TAM DELIVER - TEMPERING / PREHEAT COILS - PM 04/20/92	4/20/92	x				231	4/21/92	6/24 7/30
32	140472-TAM DELIVER - TUBES, FURNACE UPPER SW - PM 04/21/92	4/21/92		4/22/92	4/22/92		206	4/22/92	
33	140474-TAM DELIVER - UPPER FW FURNACE TUBES - PM 04/24/92	4/24/92		3/13/92	3/13/92		208	4/27/92	
34	140476-TAM DELIVER - UPPER RW FURNACE TUBES - PM 04/24/92	4/27/92		5/7/92	5/7/92		210	4/25/92	
35	140478-TAM DELIVER - AIRHEATER - PM 05/01/92	5/1/92		5/20/92	5/29/92		230	5/4/92	

listed in tam early start sequence

	activity	es tam run #26	uc	act start	act fin	status as of 6/3/92	tamp/fec activity #	es - msu ac iss #2a	notes
36	140480-TAM DELIVER - ECONOMIZER 1	5/1/92		5/20/92	5/20/92		229	5/1/92	
37	140482-TAM DELIVER - FURNACE ROOF TUBES - PM 05/04/92	5/4/92		3/12/92	3/12/92		213	5/5/92	
38	140484-TAM DELIVER ECONOMIZER TO AH - PM 05/14/92	5/24/92	x				257	5/15/92	5/22/92
39	140486-TAM DELIVER - SH DUCT TO ECON - PM 05/26/92	5/26/92	x				256	5/27/92	7/15
40	140488-TAM DELIVER DUCT - GAS GUN PURGE AIR - PM 05/27/92	5/27/92	x				252	5/28/92	6/15
41	140490-TAM DELIVER - SW LOWER FURNACE TUBES - PM 05/27/92	5/27/92		4/30/92	4/30/92		207	5/28/92	
42	140492-TAM DELIVER - FW FURNACE LOWER TUBES - PM 05/27/92	5/27/92		5/18/92	5/18/92		209	5/28/92	
43	140494-TAM DELIVER - RW LOWER FURNACE TUBES - PM 05/27/92	5/27/92	x				211	5/28/92	05/28/92
44	140496-TAM DELIVER - RETRACTABLE SOOT BLOWERS - PM 05/28/92	5/28/92	x				241	5/29/92	7/11
45	140498-TAM DELIVER - DIVISION WALL TUBES - PM 06/01/92	6/1/92		4/22/92	4/22/92		212	6/2/92	
46	140500-TAM DELIVER SOOT BLOWER CONTROLS - 06/01/92	6/1/92	x				242	6/2/92	7/11
47	140502-TAM DELIVER SOOTBLOWER ROTARY - PM 06/01/92	6/1/92	x				240	6/2/92	7/11
48	140504-TAM DELIVER - SUPERHEATER BUCK STAYS - PM 06/02/92	6/2/92	x				218	6/3/92	7/15
49	140506-TAM DELIVER - SECONDARY FAN W/ DRIVE - PM 06/02/92	6/2/92	x				233	6/3/92	6/5
50	140508-TAM DELIVER - PRIMARY FAN W/ DRIVE - PM 06/02/92	6/2/92	x				232	6/3/92	6/5
51	140510-TAM DELIVER - PNEUMATIC LIMESTONE SYSTEM - PM 06/02/92	6/2/92	x				510	6/3/92	7/11
52	140514-TAM DELIVER - SUPERHEATER HEADERS - PM 06/05/92	6/5/92	x				204	6/8/92	6/26
53	140516-TAM DELIVER - SUPERHEATER ENCLOSURE HEADERS - PM 06/08/92	6/8/92	x				205	6/9/92	8/15
54	140518-TAM DELIVER - SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	6/11/92	x				217	6/12/92	8/15
55	140520-TAM DELIVERY - TRIM PIPING - PM 07/01/92	7/1/92	x				239	7/2/92	5/15 8/11
56	140522-TAM DELIVERY - SNCR SYSTEM PUMPS, MODULES - PM 07/01/92	7/1/92	x				247	7/2/92	7/11
57	140524-TAM DELIVER - ASH COOLING SCREWS - PM 07/01/92	7/1/92	x				246	7/2/92	7/11
58	140526-TAM DELIVER - PRI AIR FANS TO AH - PM 07/06/92	7/3/92	x	6/1/92			258	7/7/92	6/11
59	140528-TAM DELIVER DUCT - SECONDARY AIR FAN TO AH - PM 07/10/92	7/10/92	x	5/28/92			260	7/13/92	
60	140530-TAM DELIVER - SUPERHEATER, PRIM & INT ELEMENTS - PM 07/15/92	7/15/92	x				215	7/16/92	7/15
61	140532-TAM DELIVER - NON METAL AIR DUCT EXP JOINT - PM 07/16/92	7/16/92	x				253	7/17/92	6/8
62	140534-TAM DELIVER - PENTHOUSE - PM 07/17/92	7/17/92	x				221	7/20/92	7/11
63	140536-TAM DELIVER - FLUOSEAL DUCT - PM 07/22/92	7/22/92	x				255	7/23/92	6/22
64	140538-TAM DELIVER INSTRUMENTS & CONTROLS - PM 07/27/92	7/27/92	x				243	7/28/92	
65	140540-TAM DELIVER - SUPERHEATER, FIN ELEMENTS - PM 08/07/92	8/7/92	x				216	8/10/92	7/15
66	140542-TAM DELIVER - CYCLONE OUTLET DUCT - PM 08/11/92	8/11/92	x				254	8/12/92	6/7

5/6/92

msu pp4 project status as of 04/28/92 - wd 594

1

	activity	sub title	earliest start	earliest finish	days	status as of 04/28/92	s #
1	140432-TAM DELIVER - AIR HEATER TO PLENUM DUCT - 02/28/92 PM - TO 140010	TAM-1	3/2/92	3/2/92	0	no word	01
2	140444-TAM DELIVER - ASH CLASSIFIER - 03/09/92 - TO 140180/	TAM-2	3/10/92	3/10/92	0	no word	02
3	140448-TAM DELIVER - BURNERS & RACKS - 03/16/92 PM - TO 140036	TAM-1	3/17/92	3/17/92	0	no word	01
4	140450-TAM DELIVER - BURNER INJECTOR & RACKS - 03/16/92 PM - TO 140036	TAM-1	3/17/92	3/17/92	0	no word	01
5	140452-TAM DELIVER - SUPPORTS & HANGERS - 03/16/92 PM - TO 140052	TAM-1	3/17/92	3/17/92	0	some on site	01
6	140452-TAM DELIVER SUPPORTS & HANGERS - PM 03/16/92	TAM-2	3/17/92	3/17/92	0	some on site	02
7	140014-TAM ROUGH SET - FURN DW LOWER HDR - 1	TAM-1	3/23/92	3/23/92	1	no word	01
8	140010-TAM ROUGH SET DUCT - AIR HEATER TO PLENUM - 2	TAM-1	3/23/92	3/24/92	2	no word	01
9	140180-TAM ROUGH SET - ASH CLASSIFIER - 2	TAM-2	3/23/92	3/24/92	2	no word	02
10	140008-TAM GROUND ASSEMBLE DUCT - ECON TO AH - 7	TAM-2	3/23/92	3/31/92	7	no word	02
11	140018-TAM ROUGH SET - FURN SW LOWER HDR - 1	TAM-1	3/24/92	3/24/92	1	no word	01
12	140020-TAM ROUGH SET - FLOOR/PLENUM - 1	TAM-1	3/25/92	3/25/92	1	no word	01
13	140016-TAM ROUGH SET DOWNCOMBERS - 2	TAM-1	3/25/92	3/26/92	2	in work	01
14	140022-TAM INSTALL FLUOSEAL SUPPORT STEEL - 3	TAM-1	3/25/92	3/27/92	3	in work	01
15	140186-TAM ERECT - ASH CLASSIFIER - 6	TAM-2	3/25/92	4/1/92	6	no word	02
16	140188-TAM ROUGH SET - ASH DUCT - 7	TAM-2	3/25/92	4/2/92	7	no word	02
17	140024-TAM ROUGH SET - BUCKSTAYS - 4	TAM-1	3/26/92	3/31/92	4	in work	01
18	000115-ALMET ERECT SEQUENCE 16 STRUCT STEEL - 2	ALMET-1	3/30/92	3/31/92	2	in work	01
19	140026-TAM ROUGH SET - FLUOSEAL - 2	TAM-1	3/30/92	3/31/92	2	in work	01
20	000120-ALMET ERECT SEQUENCE 17 STRUCT STEEL - 2	ALMET-1	4/1/92	4/2/92	2		01
21	140028-TAM ROUGH SET - COAL GRAVIMETRIC FEEDER - 2	TAM-1	4/1/92	4/2/92	2		01
22	140032-TAM ROUGH SET - FLUOSEAL DISCHARGE LEG - 2	TAM-1	4/1/92	4/2/92	2		01
23	140030-TAM ERECT - FLUOSEAL/J VALVE - 6	TAM-1	4/1/92	4/8/92	6		01
24	000124-ALMET STRUCT STEEL COMPLETE - 1	ALMET-1	4/3/92	4/3/92	1		01
25	140036-TAM ROUGH SET - BURNERS & PREPIPE RACK - 1	TAM-1	4/3/92	4/3/92	1		01
26	140056-TAM LIMESTONE GRAVIMETRIC FEEDER - 3	TAM-3	4/3/92	4/7/92	3		03
27	140034-TAM ERECT - COAL GRAVIMETRIC FEEDER - 8	TAM-1	4/3/92	4/14/92	8		01

	activity	sub title	earliest start	earliest finish	days	status as of 04/28/92	s #
2 8	140208-TAM ERECT - ASH DUCT - 10	TAM-2	4/3/92	4/16/92	10		02
2 9	020005-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - FORM/REBAR - 1	A/C-1	4/6/92	4/6/92	1	flou fl was poured 04/07/92 - demo'd	01
3 0	FR 140036-TAM ROUGH SET-BURNERS & PREPIPE RK-SHT #01 - PM 04/03/92	TAM-3	4/6/92	4/6/92	0		03
3 1	140038-TAM INSTALL COMBUSTION TOP GRID STEEL - 7	TAM-1	4/6/92	4/14/92	7		01
3 2	130005-FAI DELIVER COAL CONVEYOR EQUIPMENT - 15	FAI-5	4/6/92	4/24/92	15		05
3 3	020010-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - POUR - 1	A/C-1	4/7/92	4/7/92	1	flou fl was poured 04/07/92 - demo'd	01
3 4	020020-A/C OPERATING FLOOR - FORM/REBAR - 1	A/C-1	4/7/92	4/7/92	1		01
3 5	020035-A/C AIR HEATER, HEATER ASH LOAD FLOORS - FORM/REBAR - 1 *	A/C-1	4/8/92	4/8/92	1		01
3 6	020025-A/C OPERATING FLOOR - POUR - 1	A/C-1	4/8/92	4/9/92	2		01
3 7	020050-A/C BATTERY, SECONDARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/9/92	4/9/92	1		01
3 8	140040-TAM ROUGH SET - CYCLONE INLET EXPANSION JOINT - 1	TAM-1	4/9/92	4/9/92	1		01
3 9	140460-TAM DELIVER DUCT - SEC AIR AH TO BUSTLE - PM 04/08/92	TAM-1	4/9/92	4/9/92	0		01
4 0	140044-TAM INSTALL - FLUIDIZING BLOWER - 6	TAM-1	4/9/92	4/16/92	6		01
4 1	020040-A/C AIR HEATER, HEATER ASH LOAD FLOORS - POUR - 1 *	A/C-1	4/10/92	4/10/92	1		01
4 2	020065-A/C PRIMARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/10/92	4/10/92	1		01
4 3	020051-A/C SECONDARY FAN PEDESTALS - FORM/REBAR - 4	A/C-1	4/10/92	4/15/92	4		01
4 4	020055-A/C BATTERY, SECONDARY AIR FAN FLOOR - POUR - 1	A/C-1	4/13/92	4/13/92	1		01
4 5	140462-TAM DELIVER DUCT - COAL FD PURGE AIR - PM 04/10/92	TAM-1	4/13/92	4/13/92	0		01
4 6	020080-A/C ELEVATOR MACHINE ROOM FLOOR - FORM/REBAR - 2	A/C-1	4/13/92	4/14/92	2		01
4 7	020066-A/C PRIMARY AIR FAN PEDESTLES - FORM/REBAR - 4	A/C-1	4/13/92	4/16/92	4		01
4 8	020070-PRIMARY AIR FAN FLOOR - POUR - 1	A/C-1	4/14/92	4/14/92	1		01
4 9	140464-TAM DELIVER - SAND SCREW FEEDER - PM 04/13/92	TAM-1	4/14/92	4/14/92	0		01
5 0	140062-TAM ROUGH SET - SCREW CONVEYOR SAND - 2	TAM-1	4/14/92	4/15/92	2		01
5 1	020085-A/C ELEVATOR MACHINE ROOM FLOOR - POUR - 1	A/C-1	4/15/92	4/15/92	1		01
5 2	140058-TAM ROUGH SET DUCT - SEC AIR AH TO BUSTLE - 2	TAM-1	4/15/92	4/16/92	2		01
5 3	140048-TAM INSTALL STEAM DRUM - 3	TAM-1	4/15/92	4/17/92	3		01
5 4	140046-TAM INSTALL - CYCLONE SUPPORT STEEL - 5	TAM-1	4/15/92	4/21/92	5		01

	activity	sub title	earliest start	earliest finish	days	status as of 04/28/92	s#
5 5	020056-A/C SECONDARY FAN PEDESTALS - POUR - 1	A/C-1	4/16/92	4/16/92	1		01
5 6	140468-TAM DELIVER - SNCR SYSTEM TANK - PM 04/15/92	TAM-2	4/16/92	4/16/92	0		02
5 7	140068-TAM ERECT SAND/FILL - SCREW CONVEYOR - 2	TAM-1	4/16/92	4/17/92	2		01
5 8	140070 - TAM SET - UREA TANK - 2	TAM-2	4/16/92	4/17/92	2		02
5 9	020071-A/C PRIMARY FAN PEDESTLES - POUR - 1	A/C-1	4/17/92	4/17/92	1		01
6 0	140060-TAM ROUGH SET DUCT - COAL FD PURGE AIR - 2 *	TAM-1	4/17/92	4/20/92	2		01
6 1	140236-TAM ERECT - ASH DUCT - 4	TAM-2	4/17/92	4/22/92	4		02
6 2	140470-TAM DELIVER - TEMPERING / PREHEAT COILS - PM 04/20/92	TAM-2	4/21/92	4/21/92	0		02
6 3	140064-TAM ROUGH SET - OF DUCT BUSTLE TO BURNERS - 2	TAM-1	4/21/92	4/22/92	2		01
6 4	140472-TAM DELIVER - TUBES, FURNACE UPPER SW - PM 04/21/92	TAM-1	4/22/92	4/22/92	0		01
6 5	140476-TAM DELIVER - UPPER RW FURNACE TUBES - PM 04/24/92	TAM-2	4/25/92	4/25/92	0		02
6 6	140474-TAM DELIVER - UPPER FW FURNACE TUBES - PM 04/24/92	TAM-1	4/27/92	4/27/92	0		01

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April 28, 1992

Subject: Agenda notes - for meeting 05/07/92

Project: Michigan State University
T. B. Simon Power Plant Unit 4 Addition
East Lansing, Michigan

To: Jim Simons - MSU project representative

From: Ralph J. Stephenson - Consultant

Meeting locations: Job site office at Power Plant #4

General Observations:

01. The A/C planning and scheduling information must be a unified source of project wide planning, scheduling and monitoring information. The objective of a work plan and schedule is to provide all parties to the project - the owner, the design team, the dfi contractors, the sub contractors and the general project manager - identifiable, consistent, agreed to, and clearly understood standards of performance to which they are all working and planning.

02. A/C must prepare and furnish the owner a set of planning and monitoring information that insures the owner can track the project to the fullest degree desired and be assured that the owner analysis is based on accurate information.

03. A/C must make every effort possible to adhere to the planning and scheduling information they provide to the project team. When deviations occur that require updating, explanation or concerted project team effort, A/C must be able to explain the corrections for the deviation to all parties and expect the corrective action to be understood.

04. How are the A/C plans and schedules to be identified, to whom are they to be furnished and what should be the instructions for their use. The techniques and procedures to be used by A/C should be

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April 28, 1992

defined by them, approved by the owner, and clearly explained to all members of the project team.

05. Accountability for lags such as now exist on the project must be assignable. Once identified, the machinery for correcting lagging or inadequate actions should be able to be clearly explained to the owner, and the results of the corrective action **must be measurable**.

06. We do not as yet have adequate tie in data to accurately determine the real late finish and late start dates for each activity. It is only with this data that the true significance of a lag can be determined. It is urgently needed for accurate monitorings to be made.

07. Each successive monitoring has shown an increase in lag over planned early starts and early finishes. Since it is relatively early in the project these increases should be minimized now, and the overall job planning brought more closely in line with the expected than is presently the case. This is the responsibility of A/C acting in concert with its subcontractors, the dfi contractors, and the owner.

08. It does not appear that the activities in many of the A/C computer runs are fully connected either internally nor to outside constraints to and from the various activities. Lack of this information is presently stalling any effort to develop an accurate and reliable monitoring system free of non A/C interpretation. This situation must be corrected.

09. The mechanical work computer run for IMC activities is yet to be completed. This is a critical set of work since it relates closely to Tampella's boiler work. Until we get this data it is not possible to accurately and reliably evaluate work status.

10. Architectural trades work is due to begin within the next two months. This work is critical to closing the building in against winter weather. We need a full evaluation of the current plan of work to insure the close in of the building can be accomplished in a timely fashion without interfering with or delaying setting and installation of boiler and generator installation along with all other major equipment setting needs.

11. With the current lags the computer runs should be fully updated by A/C with all current data available used to insure accuracy. The updated plan of work should show valid ties between the

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April 28, 1992

various trades work on the project. It should also be clearly identified and issued for use by all concerned with the project work.

12. For an accurate late start, late finish evaluation to be made, the interrelations between trades and major contractors on the project **must** be further defined.

Agenda Recommendations:

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May 7, 1992

Objectives of meeting: MSU PP#4 planning and scheduling

- To review the current status of project planning and scheduling by A/C and to discuss and decide on the methods of proceeding with future planning and scheduling efforts with the following in mind.
 - a. The general project manager (A/C), the owner, the design team, the dfi contractors and the sub contractors must be encouraged to make effective use of the plans and schedules for the project.
 - b. Adequate review processes must be agreed upon to insure valid acceptance and effective use of A/C project plans and schedules?
 - c. Input to A/C from all parties including the the owner, the design team, the dfi contractors and the sub contractors must be assured to produce a workable, accurate, consistent and reliable plan and schedule of work.
 - d. Proper and timely monitoring of the project is essential by all parties having a stake in the job. A/C must provide these parties with planning and scheduling documents that allow all of them, the owner, the design team, the dfi contractors and the sub contractors to conduct such monitorings.
 - e. The system of identification and distribution of the planning and scheduling documents from A/C must be known and understood by all, and must be followed consistently and constantly.
 - f. The correction processes for job situations that show deviations from the accepted standards of performance must be formulated, agreed upon by all affected, implemented, and reviewed regularly for their operational worth.
 - g. The planning and scheduling documents must be completed by A/C in the immediate future. These documents must contain adequate cross restraints between the various disciplines and trades so that the material is accurate and reliable. In addition the material must be such that major true late finishes and starts can be determined with confidence.
 - h. The use of float time should be clearly understood.

4/5/92

Marker on d 305

1 comp

4/7/92 428

msu pp4 data - shts 01 to 05 - i2a a/c netwks

	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
1	000010-T/R TO AWARD CONTRACT TO ALBERICI/CLARK - 11/04/91	A/C-1	11/4/91	11/4/91	Task	0	01	x	complete
2	000015-A/C MOBILIZATION - 5	A/C-1	11/4/91	11/8/91	Task	5	01	x	complete
3	T/R TO START OF ALMET ERECT STRUCT STEEL - 01/06/92	ALMET-1	1/6/92	1/6/92	Task	0	01	x	complete
4	000035-ALMET ERECT SEQUENCE 1 STRUCT STEEL - 5	ALMET-1	1/6/92	1/10/92	Task	5	01	x	complete
5	000040-ALMET ERECT SEQUENCE 2 STRUCT STEEL - 5	ALMET-1	1/13/92	1/17/92	Task	5	01	x	complete
6	000045-ALMET ERECT SEQUENCE 3 STRUCT STEEL - 6	ALMET-1	1/20/92	1/27/92	Task	6	01	x	complete
7	000050-ALMET ERECT SEQUENCE 4 STRUCT STEEL - 5	ALMET-1	1/28/92	2/3/92	Task	5	01	x	complete
8	000055-ALMET ERECT SEQUENCE 5 STRUCT STEEL - 6	ALMET-1	2/4/92	2/11/92	Task	6	01	x	complete
9	000060-ALMET ERECT SEQUENCE 6 STRUCT STEEL - 6	ALMET-1	2/12/92	2/19/92	Task	6	01	x	complete
10	140430-TAM DELIVER - CYCLONES - 02/14/92 PM - TO 140006	TAM-3	2/17/92	2/17/92	Milestone	0	03		Complete on job?
11	000065-ALMET ERECT SEQUENCE 7 STRUCT STEEL - 2	ALMET-1	2/20/92	2/21/92	Task	2	01	x	complete
12	000070-ALMET ERECT SEQUENCE 8 STRUCT STEEL - 3	ALMET-1	2/24/92	2/26/92	Task	3	01	x	complete
13	000075-ALMET ERECT SEQUENCE 9 STRUCT STEEL - 5	ALMET-1	2/27/92	3/4/92	Task	5	01	x	complete
14	140432-TAM DELIVER - AIR HEATER TO PLENUM DUCT - 02/28/92 PM - TO 140010	TAM-1	3/2/92	3/2/92	Milestone	0	01		?
15	T/R TO TAMPELLA START MOBILIZATION - AM 03/02/92	TAM-1	3/2/92	3/2/92	Milestone	0	01	x	complete
16	140000- TAMPELLA MOBILIZATION - 15	TAM-1	3/2/92	3/20/92	Task	15	01		Complete?
17	140434-TAM DELIVER - FLUOSEAL - 03/02/92 PM - TO 140026	TAM-1	3/3/92	3/3/92	Milestone	0	01		on site?
18	140436-TAM DELIVER - FURNACE LOWER HEADERS - 03/04/92 PM - TO 140018	TAM-1	3/5/92	3/5/92	Milestone	0	01		on site?
19	000080-ALMET ERECT SEQUENCE 10 STRUCT STEEL - 2	ALMET-1	3/5/92	3/6/92	Task	2	01	x	complete
20	140438-TAM DELIVER - FURNACE FLOOR TUBES - 03/05/92 PM - TO 140020	TAM-1	3/6/92	3/6/92	Milestone	0	01		Complete?
21	140440-TAM DELIVER - FURNACE BUCKSTAYS - 03/06/92 PM - TO 140024	TAM-1	3/9/92	3/9/92	Milestone	0	01		Complete?
22	140442-TAM DELIVER - FRAMING STEEL - 03/06/92 PM - TO 140022, 038, 046, 084, 104, 164	TAM-1	3/9/92	3/9/92	Milestone	0	01		some on job
23	140442-TAM DELIVER - FRAMING STEEL - 03/06/92 PM - TO 140022, 038, 046, 084, 104, 164	TAM-1	3/9/92	3/9/92	Milestone	0	01		some on job
24	140442-TAM DELIVER - FRAMING STEEL - PM 03/06/92	TAM-2	3/9/92	3/9/92	Milestone	0	02		some on job
25	000085-ALMET ERECT SEQUENCE 11 STRUCT STEEL - 4	ALMET-1	3/9/92	3/12/92	Task	4	01	x	complete
26	140444-TAM DELIVER - ASH CLASSIFIER - 03/09/92 - TO 140180	TAM-2	3/10/92	3/10/92	Milestone	0	02		?
27	140446-TAM DELIVER - COAL FEEDERS - 03/12/92 PM - TO 140028	TAM-1	3/13/92	3/13/92	Milestone	0	01		?
28	000090-ALMET ERECT SEQUENCE 12 STRUCT STEEL - 2	ALMET-1	3/13/92	3/16/92	Task	2	01		Complete?
29	140448-TAM DELIVER - BURNERS & RACKS - 03/16/92 PM - TO 140036	TAM-1	3/17/92	3/17/92	Milestone	0	01		?

listed in es, ef, activity number sequence

4/5/92

msu pp4 data - shts 01 to 05 - i2a a/c netwks

4/7/92

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
59	140032-TAM ROUGH SET - FLUOSEAL DISCHARGE LEG - 2	TAM-1	4/1/92	4/2/92	Task	2	01		
60	140030-TAM ERECT - FLUOSEAL/J VALVE - 6	TAM-1	4/1/92	4/8/92	Task	6	01		
61	000124-ALMET STRUCT STEEL COMPLETE - 1	ALMET-1	4/3/92	4/3/92	Task	1	01		
62	140036-TAM ROUGH SET - BURNERS & PREPIPE RACK - 1	TAM-1	4/3/92	4/3/92	Task	1	01		
63	140458-TAM DELIVER LIMESTONE FEEDERS - PM 04/02/92	TAM-3	4/3/92	4/3/92	Milestone	0	03		
64	140056-TAM LIMESTONE GRAVIMETRIC FEEDER - 3	TAM-3	4/3/92	4/7/92	Milestone	3	03		
65	140034-TAM ERECT - COAL GRAVIMETRIC FEEDER - 8	TAM-1	4/3/92	4/14/92	Task	8	01		
66	140208-TAM ERECT - ASH DUCT - 10	TAM-2	4/3/92	4/16/92	Task	10	02		
67	020005-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - FORM/REBAR - 1	A/C-1	4/6/92	4/6/92	Task	1	01		Complete (Plan 1001)
68	FR 140036-TAM ROUGH SET-BURNERS & PREPIPE RK-SHT #01 - PM 04/03/92	TAM-3	4/6/92	4/6/92	Milestone	0	03		
69	T/R TO 04/06/92	FAI-5	4/6/92	4/6/92	Task	0	05		
70	140038-TAM INSTALL COMBUSTION TOP GRID STEEL - 7	TAM-1	4/6/92	4/14/92	Task	7	01		
71	130005-FAI DELIVER COAL CONVEYOR EQUIPMENT - 15	FAI-5	4/6/92	4/24/92	Task	15	05		
72	000125-ALMET ERECT LEAVE OUT STRUCT STEEL - 65	ALMET-1	4/6/92	7/7/92	Task	65	01		Most on job (check?) starting
73	020010-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - POUR - 1	A/C-1	4/7/92	4/7/92	Task	1	01		poored 4/7/92
74	020020-A/C OPERATING FLOOR - FORM/REBAR - 1	A/C-1	4/7/92	4/7/92	Task	1	01		
75	020035-A/C AIR HEATER, HEATER ASH LOAD FLOORS - FORM/REBAR - 1 *	A/C-1	4/8/92	4/8/92	Task	1	01		
76	020025-A/C OPERATING FLOOR - POUR - 1	A/C-1	4/8/92	4/9/92	Task	2	01		
77	020015-A/C ELECT. MEZZ, FLOU SEAL, BATT RM - CURE - 23	A/C-1	4/8/92	5/8/92	Task	23	01		
78	020050-A/C BATTERY, SECONDARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/9/92	4/9/92	Task	1	01		
79	140040-TAM ROUGH SET - CYCLONE INLET EXPANSION JOINT - 1	TAM-1	4/9/92	4/9/92	Task	1	01		
80	140460-TAM DELIVER DUCT - SEC AIR AH TO BUSTLE - PM 04/08/92	TAM-1	4/9/92	4/9/92	Milestone	0	01		
81	140044-TAM INSTALL - FLUIDIZING BLOWER - 6	TAM-1	4/9/92	4/16/92	Task	6	01		
82	140042-TAM ERECT DUCT - PRI AIR AH TO PLENUM - 30 *	TAM-1	4/9/92	5/20/92	Task	30	01		
83	020040-A/C AIR HEATER, HEATER ASH LOAD FLOORS - POUR - 1 *	A/C-1	4/10/92	4/10/92	Task	1	01		
84	020065-A/C PRIMARY FAN FLOOR - FORM/REBAR - 1	A/C-1	4/10/92	4/10/92	Task	1	01		
85	020051-A/C SECONDARY FAN PEDESTALS - FORM/REBAR - 4	A/C-1	4/10/92	4/15/92	Task	4	01		
86	020030-A/C OPERATING ROOM - CURE - 20	A/C-1	4/10/92	5/7/92	Task	20	01		
87	020055-A/C BATTERY, SECONDARY AIR FAN FLOOR - POUR - 1	A/C-1	4/13/92	4/13/92	Task	1	01		

listed in es, ef, activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
8 8	140462-TAM DELIVER DUCT - COAL FD PURGE AIR - PM 04/10/92	TAM-1	4/13/92	4/13/92	Milestone	0	01		
8 9	020080-A/C ELEVATOR MACHINE ROOM FLOOR - FORM/REBAR - 2	A/C-1	4/13/92	4/14/92	Task	2	01		
9 0	020066-A/C PRIMARY AIR FAN PEDESTLES - FORM/REBAR - 4	A/C-1	4/13/92	4/16/92	Task	4	01		
9 1	020045-A/C AIR HEATER, HEATER ASH LOAD FLOORS - CURE - 23	A/C-1	4/13/92	5/13/92	Task	23	01		
9 2	020070-PRIMARY AIR FAN FLOOR - POUR - 1	A/C-1	4/14/92	4/14/92	Task	1	01		
9 3	140464-TAM DELIVER - SAND SCREW FEEDER - PM 04/13/92	TAM-1	4/14/92	4/14/92	Milestone	0	01		
9 4	140062-TAM ROUGH SET - SCREW CONVEYOR SAND - 2	TAM-1	4/14/92	4/15/92	Task	2	01		
9 5	020060-A/C BATTERY, SECONDARY AIR FAN FLOOR - CURE - 23	A/C-1	4/14/92	5/14/92	Task	23	01		
9 6	020085-A/C ELEVATOR MACHINE ROOM FLOOR - POUR - 1	A/C-1	4/15/92	4/15/92	Task	1	01		
9 7	140058-TAM ROUGH SET DUCT - SEC AIR AH TO BUSTLE - 2	TAM-1	4/15/92	4/16/92	Task	2	01		
9 8	140048-TAM INSTALL STEAM DRUM - 3	TAM-1	4/15/92	4/17/92	Task	3	01		
9 9	140046-TAM INSTALL - CYCLONE SUPPORT STEEL - 5	TAM-1	4/15/92	4/21/92	Task	5	01		
1 0 0	020075-A/C PRIMARY AIR FAN FLOOR - CURE - 23	A/C-1	4/15/92	5/15/92	Task	23	01		
1 0 1	020056-A/C SECONDARY FAN PEDESTALS - POUR - 1	A/C-1	4/16/92	4/16/92	Task	1	01		
1 0 2	140468-TAM DELIVER - SNCR SYSTEM TANK - PM 04/15/92	TAM-2	4/16/92	4/16/92	Milestone	0	02		
1 0 3	140068-TAM ERECT SAND/FILL - SCREW CONVEYOR - 2	TAM-1	4/16/92	4/17/92	Task	2	01		
1 0 4	140070 - TAM SET - UREA TANK - 2	TAM-2	4/16/92	4/17/92	Task	2	02		
1 0 5	020090-A/C ELEVATOR MACHINE ROOM FLOOR - CURE - 23	A/C-1	4/16/92	5/18/92	Task	23	01		
1 0 6	020071-A/C PRIMARY FAN PEDESTLES - POUR - 1	A/C-1	4/17/92	4/17/92	Task	1	01		
1 0 7	140060-TAM ROUGH SET DUCT - COAL FD PURGE AIR - 2 *	TAM-1	4/17/92	4/20/92	Task	2	01		
1 0 8	140236-TAM ERECT - ASH DUCT - 4	TAM-2	4/17/92	4/22/92	Task	4	02		
1 0 9	140054-TAM INSTALL - FLUIDIZING DUCT - 15	TAM-1	4/17/92	5/7/92	Task	15	01		
1 1 0	020061-A/C SECONDARY FAN PEDESTALS - CURE - 20	A/C-1	4/17/92	5/14/92	Task	20	01		
1 1 1	140052-TAM INSTALL COMBUSTOR BOILER HANGERS - 10	TAM-1	4/20/92	5/1/92	Task	10	01		
1 1 2	020076-A/C PRIMARY FAN PEDESTLES - CURE - 20	A/C-1	4/20/92	5/15/92	Task	20	01		
1 1 3	140470-TAM DELIVER - TEMPERING / PREHEAT COILS - PM 04/20/92	TAM-2	4/21/92	4/21/92	Milestone	0	02		
1 1 4	140064-TAM ROUGH SET - OF DUCT BUSTLE TO BURNERS - 2	TAM-1	4/21/92	4/22/92	Task	2	01		
1 1 5	140472-TAM DELIVER - TUBES, FURNACE UPPER SW - PM 04/21/92	TAM-1	4/22/92	4/22/92	Milestone	0	01		
1 1 6	140476-TAM DELIVER - UPPER RW FURNACE TUBES - PM 04/24/92	TAM-2	4/25/92	4/25/92	Milestone	0	02		

	activity	sub title	earliest start	earliest finish	type	days	s#	comp	status as of
117	140474-TAM DELIVER - UPPER FW FURNACE TUBES - PM 04/24/92	TAM-1	4/27/92	4/27/92	Milestone	0	01		
118	130010-FAI PART DELIVER TRIPPER ROOM ROOF STEEL - 10	FAI-5	5/4/92	5/4/92	Task	10	05		
119	140478-TAM DELIVER - AIRHEATER - PM 05/01/92	TAM-2	5/4/92	5/4/92	Milestone	0	02		
120	140478-TAM DELIVER AIR HEATER - PM 05/01/92	TAM-2	5/4/92	5/4/92	Milestone	0	02		
121	T/R TO AM 05/04/92	TAM-5	5/4/92	5/4/92	Task	0	05		
122	140066-TAM UPPER COMBUSTOR HEADERS - 5	TAM-1	5/4/92	5/8/92	Task	5	01		
123	130015-FAI PART DELIVER TRIPPER ROOM ROOF STEEL - 10	FAI-5	5/4/92	5/15/92	Task	10	05		
124	130010A-FAI COMP REWORK EXIST. 24" FEED CONVEYOR - 41	FAI-5	5/4/92	6/30/92	Task	41	05		
125	140482-TAM DELIVER - FURNACE ROOF TUBES - PM 05/04/92	TAM-3	5/5/92	5/5/92	Milestone	0	03		
126	140072-TAM ROUGH SET - FURN SIDEWALL UPPER - 3	TAM-1	5/11/92	5/13/92	Task	3	01		
127	140074-TAM ROUGH SET - FURN FW UPPER - 3	TAM-1	5/14/92	5/18/92	Task	3	01		
128	140484-TAM DELIVER ECONOMIZER TO AH - PM 05/14/92	TAM-2	5/15/92	5/15/92	Milestone	0	02		
129	130015-FAI COMP DELIVER TRIPPER ROOM ROOF STEEL - 5	FAI-5	5/18/92	5/22/92	Task	5	05		
130	130020-FAI INSTALL TRIPPER ROOM ROOF STEEL - 14	FAI-5	5/18/92	6/5/92	Task	14	05		
131	140076-TAM GROUND ASSEMBLE - FURN DW - 20	TAM-3	5/18/92	6/15/92	Milestone	20	03		
132	140078-TAM ROUGH SET - FURN RW UPPER - 2	TAM-2	5/19/92	5/20/92	Task	2	02		
133	140080-TAM ROUGH SET - AIR HEATER HOPPER - 2	TAM-2	5/21/92	5/22/92	Task	2	02		
134	140082-TAM PART ERECT - UPPER FURN SIDEWALL - 3	TAM-2	5/21/92	5/26/92	Task	3	02		
135	140084-TAM AIR HEATER SUPPORT STEEL - 3	TAM-2	5/26/92	5/28/92	Task	3	02		
136	140486-TAM DELIVER - SH DUCT TO ECON - PM 05/26/92	TAM-2	5/27/92	5/27/92	Milestone	0	02		
137	140082A-TAM COMP ERECT - UPPER FURN SIDEWALL - 3	TAM-2	5/27/92	5/29/92	Task	3	02		
138	140086-TAM FURN SW WELD UPPER - 9	TAM-2	5/27/92	6/8/92	Task	9	02		
139	140126-TAM ROUGH SET - GAS GUN PURGE AIR - 1	TAM-2	5/28/92	5/28/92	Task	1	02		
140	140488-TAM DELIVER DUCT - GAS GUN PURGE AIR - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone	0	02		
141	140490-TAM DELIVER - SW LOWER FURNACE TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone	0	02		
142	140492-TAM DELIVER - FW FURNACE LOWER TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone	0	02		
143	140494-TAM DELIVER - RW LOWER FURNACE TUBES - PM 05/27/92	TAM-2	5/28/92	5/28/92	Milestone	0	02		
144	140496-TAM DELIVER - RETRACTABLE SOOT BLOWERS - PM 05/28/92	TAM-2	5/29/92	5/29/92	Milestone	0	02		
145	140088-TAM ROUGH SET - STEAM COIL AIR HEATER - 2	TAM-2	5/29/92	6/1/92	Task	2	02		

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
146	140132-TAM ROUGH SET - SAND PIPING TO COAL FEEDER - 2	TAM-2	5/29/92	6/1/92	Task	2	02		
147	140364-TAM ERECT DUCT - COAL FD PURGE AIR - 15	TAM-3	5/29/92	6/18/92	Milestone	15	03		
148	140090-TAM ERECT - UPPER FURN FW - 6	TAM-2	6/1/92	6/8/92	Task	6	02		
149	140092-TAM ROUGH SET - PRIMARY AIR HEATER - 1	TAM-2	6/2/92	6/2/92	Task	1	02		
150	140498-TAM DELIVER - DIVISION WALL TUBES - PM 06/01/92	TAM-3	6/2/92	6/2/92	Milestone	0	03		
151	140500-TAM DELIVER SOOT BLOWER CONTROLS - 06/01/92	TAM-3	6/2/92	6/2/92	Milestone	0	03		
152	140502-TAM DELIVER SOOTBLOWER ROTARY - PM 06/01/92	TAM-2	6/2/92	6/2/92	Milestone	0	02		
153	T/R TO AM 06/02/92	TAM-5	6/2/92	6/2/92	Task	0	05		
154	140140-TAM ERECT - SAND PIPING TO COAL FEEDER - 8	TAM-2	6/2/92	6/11/92	Task	8	02		
155	130025-FAI DELIVER NEW BUNKER FEED BELT CONVEYOR - 2-15/E-F - 19	FAI-5	6/2/92	6/26/92	Task	19	05		
156	140098-TAM ROUGH SET - SECONDARY AIR HEATERS - 1	TAM-2	6/3/92	6/3/92	Task	1	02		
157	140150-TAM LIMESTONE SLIDE GATE - 1	TAM-2	6/3/92	6/3/92	Task	1	02		
158	140504-TAM DELIVER - SUPERHEATER BUCK STAYS - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone	0	03		
159	140504-TAM DELIVER - SUPERHEATER BUCKSTAYS - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone	0	02		
160	140504-TAM DELIVER - SUPERHEATER BUCKSTAYS - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone	0	02		
161	140506-TAM DELIVER - SECONDARY FAN W/ DRIVE - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone	0	03		
162	140508-TAM DELIVER - PRIMARY FAN W/ DRIVE - PM 06/02/92	TAM-3	6/3/92	6/3/92	Milestone	0	03		
163	140510-TAM DELIVER - PNEUMATIC LIMESTONE SYSTEM - PM 06/02/92	TAM-2	6/3/92	6/3/92	Milestone	0	02		
164	140096-TAM ERECT PRIMARY AIR HEATER - 4	TAM-2	6/3/92	6/8/92	Task	4	02		
165	140152-TAM LIMESTONE LINE - FEEDER TO BIN - 6	TAM-2	6/3/92	6/10/92	Task	6	02		
166	140100-TAM ROUGH SET DUCT - ECON TO AH - 2	TAM-2	6/4/92	6/5/92	Task	2	02		
167	140154-TAM LIMESTONE ROTARY AIR LOCK - 2	TAM-2	6/4/92	6/5/92	Task	2	02		
168	140102-TAM ROUGH SET EXPANSION JOINT - 3	TAM-2	6/4/92	6/8/92	Task	3	02		
169	140514-TAM DELIVER - SUPERHEATER HEADERS - PM 06/05/92	TAM-2	6/8/92	6/8/92	Milestone	0	02		
170	140104-TAM INSTALL - ECONOMIZER SUPPORT STEEL - 3	TAM-2	6/8/92	6/10/92	Task	3	02		
171	140158-TAM LIMESTONE CHUTES - 4	TAM-2	6/8/92	6/11/92	Task	4	02		
172	140516-TAM DELIVER - SUPERHEATER ENCLOSURE HEADERS - PM 06/08/92	TAM-2	6/9/92	6/9/92	Milestone	0	02		
173	140518-TAM DELIVER - SUPERHEATER ENCLOSURE HEADERS - PM 06/08/92	TAM-2	6/9/92	6/9/92	Milestone	0	02		
174	140128-TAM ROUGH SET - FURN LW LOWER - 3	TAM-2	6/9/92	6/11/92	Task	3	02		

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	activity	sub title	earliest start	earliest finish	type	days	s#	comp	status as of
175	140108-TAM ERECT - SECONDARY AIR HEATER - 4	TAM-2	6/9/92	6/12/92	Task	4	02		
176	140144-TAM ROUGH SET - FURN SW LOWER - 4	TAM-2	6/9/92	6/12/92	Task	4	02		
177	140106-TAM ERECT - UPPER FURN RW - 7	TAM-2	6/9/92	6/17/92	Task	7	02		
178	140110-TAM ERECT - ECONOMIZER - 3	TAM-2	6/11/92	6/15/92	Task	3	02		
179	140518-TAM DELIVER - SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-3	6/12/92	6/12/92	Milestone	0	03		
180	140518-TAM DELIVER - SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-2	6/12/92	6/12/92	Milestone	0	02		
181	140518-TAM DELIVER SUPERHEATER ENCLOSURE WALLS - PM 06/11/92	TAM-2	6/12/92	6/12/92	Task	0	02		
182	140172-TAM LIMESTONE ROTARY BLOWER - 3	TAM-2	6/12/92	6/16/92	Task	3	02		
183	140094-TAM ERECT - STEAM COIL AIR HEATER - 4	TAM-2	6/12/92	6/17/92	Task	4	02		
184	140142-TAM ERECT - LOWER FURN FW -	TAM-2	6/12/92	6/22/92	Task	7	02		
185	170001-IMC IMC - SET ACID TANK - 1	IMC-4	6/15/92	6/15/92	Milestone	1	04		
186	T/R TO IMC START SETTING ACID TANK - AM 06/15/92	IMC-4	6/15/92	6/15/92	Milestone	0	04		
187	140112-TAM ERECT - AIR HEATER HOPPER - 6	TAM-2	6/15/92	6/22/92	Task	6	02		
188	140160-TAM ERECT - LOWER FURN SW - 6	TAM-2	6/15/92	6/22/92	Task	6	02		
189	140114-TAM ROUGH SET DUCT - SH TO ECONOMIZER - 2	TAM-2	6/16/92	6/17/92	Task	2	02		
190	140124-TAM ROUGH SET SOOT BLOWER PIPING - 2	TAM-2	6/16/92	6/17/92	Task	2	02		
191	140122-TAM ERECT - 6" FEEDWATER PIPE - 4	TAM-2	6/16/92	6/19/92	Task	4	02		
192	140148-TAM SOOT BLOWERS - ROTARY - 4	TAM-2	6/16/92	6/19/92	Task	4	02		
193	170002-IMC IMC - PART SET AND PIPE CHEM / ELEC. EQUIPMENT - 5	IMC-4	6/16/92	6/22/92	Milestone	5	04		
194	140116-TAM ERECT DUCT - ECON TO AH - 6	TAM-2	6/16/92	6/23/92	Task	6	02		
195	140118-TAM ERECT - EXPANSION JOINT - 6	TAM-2	6/16/92	6/23/92	Task	6	02		
196	140120-TAM FEEDWATER VALVE & PIPING - 7	TAM-2	6/16/92	6/24/92	Task	7	02		
197	140136-TAM ROUGH SET - RETRACTABLE SOOT BLOWER - 2	TAM-2	6/18/92	6/19/92	Task	2	02		
198	140134-TAM WELD UPPER FURN RW - 8	TAM-2	6/18/92	6/29/92	Task	8	02		
199	140130-TAM ERECT BUCKSTAYS - 70	TAM-2	6/18/92	9/25/92	Task	70	02		
200	T/R TO START OF THERMAL - DYNAMIC MOBILIZATION - 06/22/92	THE-5	6/22/92	6/22/92	Task	0	05		
201	140138-TAM ROUGH SET - HEAT RECOVERY AREA BUCKSTAYS - 3	TAM-2	6/22/92	6/24/92	Task	3	02		
202	140146-TAM INSTALL - CYCLONE SUPPORT STEEL - 4	TAM-2	6/22/92	6/25/92	Task	4	02		
203	136001-THE - THERMAL - DYNAMIC MOBILIZATION - 5	THE-5	6/22/92	6/26/92	Task	5	05		

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	activity	sub title	earliest start	earliest finish	type	days	s#	comp	status as of
204	022000-A/C A/C PART DEMO THREE WINDOWS & CURB - 0	A/C-4	6/23/92	6/23/92	Milestone	0 04			
205	080005-VAN PART DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 0	VAN-4	6/23/92	6/23/92	Milestone	0 04			
206	T/R TO JUNE 23, 1992	VAN-4	6/23/92	6/23/92	Milestone	0 04			
207	022000A - A/C A/C COMP DEMO THREE WINDOWS & CURB - 2	A/C-4	6/23/92	6/24/92	Milestone	2 04			
208	030030-SCH PART ELECT / CHEM BUILDING MASONRY - 2	SCH-4	6/23/92	6/24/92	Milestone	2 04			
209	080005A-VAN COMP DELIVER HOLLOW METAL CHEM / ELEC. BUILDING - 5	VAN-4	6/23/92	6/29/92	Milestone	5 04			
210	090005-ESS DELIVER HARDWARE CHEM / ELEC BUILDING - 5	ESS-4	6/23/92	6/29/92	Milestone	5 04			
211	119000-ALL DELIVER LOUVERS CHEM/ELEC. BUILDING - 5	ALL-4	6/23/92	6/29/92	Milestone	5 04			
212	170002-IMC IMC - COMP SET AND PIPE CHEM / ELEC. EQUIPMENT - 5	IMC-4	6/23/92	6/29/92	Milestone	5 04			
213	140170-TAM WELD - FURN FW MIDDLE TUBE - 7	TAM-2	6/23/92	7/1/92	Task	7 02			
214	140176-TAM WELD - FURN SW MIDDLE TUBE - 9	TAM-2	6/23/92	7/6/92	Task	9 02			
215	140156-TAM ROUGH SET - INT SH OUTLET HEADER - 2	TAM-2	6/25/92	6/26/92	Task	2 02			
216	030030A-SCH COMP ELECT / CHEM BUILDING MASONRY - 3	SCH-4	6/25/92	6/29/92	Milestone	3 04			
217	140162-TAM ROUGH SET - DESUPERHEATER HDR - 1	TAM-2	6/29/92	6/29/92	Task	1 02			
218	136005-THE - PART COOLING TOWER STRUCTURAL FRAMING - 15	THE-5	6/29/92	7/20/92	Task	15 05			
219	022005-A/C A/C - INSTALL DOORS AND HARDWARE - 2	A/C-4	6/30/92	7/1/92	Milestone	2 04			
220	119005-ALL INDSTALL LOUVERS CHEM/ELEC. BUILDING - 2	ALL-4	6/30/92	7/1/92	Milestone	2 04			
221	140168-TAM ERECT - DESUPERHEATER HEADER - 2	TAM-2	6/30/92	7/1/92	Task	2 02			
222	140166-TAM ROUGH SET - LOWER FURN RW - 3	TAM-2	6/30/92	7/2/92	Task	3 02			
223	070002-WEST CHEM / ELEC. CAULKING - 5	WES-4	6/30/92	7/7/92	Milestone	5 04			
224	140164-TAM HEAT RECOVERY AREA TOP GRID STEEL - 5	TAM-2	6/30/92	7/7/92	Task	5 02			
225	140520-TAM DELIVERY - TRIM PIPING - PM 07/01/92	TAM-3	7/2/92	7/2/92	Milestone	0 03			
226	140522-TAM DELIVERY - SNCR SYSTEM PUMPS, MODULERS - PM 07/01/92	TAM-2	7/2/92	7/2/92	Milestone	0 02			
227	140522-TAM DELIVERY - SNCR SYSTEM PUMPS, MODULERS - PM 07/01/92	TAM-3	7/2/92	7/2/92	Milestone	0 03			
228	140524-TAM DELIVER - ASH COOLING SCREWS - PM 07/01/92	TAM-2	7/2/92	7/2/92	Task	0 02			
229	180001-DFIE DFI - SET MAJOR ELECT. EQUIPMENT - 1	DFIE-4	7/2/92	7/2/92	Milestone	1 04			
230	FROM 140168 - TAM ERECT - DESUPERHEATER HEADER - PM 07/01/92 - SHT #02	TAM-3	7/2/92	7/2/92	Milestone	0 03			
231	140196-TAM UREA RECIRC PUMP - 2	TAM-2	7/2/92	7/6/92	Task	2 02			
232	140198-TAM UREA CHEMICAL INJECTION SYSTEM - 3	TAM-2	7/2/92	7/7/92	Task	3 02			

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
233	140200-TAM UREA DISTRIBUTION MODULES - 5	TAM-2	7/2/92	7/9/92	Task	5	02		
234	140206-TAM ASH COOLING SCREW CONVEYOR - 6	TAM-2	7/2/92	7/10/92	Task	6	02		
235	T/R TO AM 07/06/92	TAM-5	7/6/92	7/6/92	Task	0	05		
236	040005-GJOH SET ROOF STEEL - 5	GJOH-4	7/6/92	7/10/92	Milestone	5	04		
237	140174 -TAM ERECT LOWER FURN RW - 7	TAM-2	7/6/92	7/14/92	Task	7	02		
238	130035-FAI DELIVER BUNKER PURGE CONVEYOR - 10-15/E-F 15	FAI-5	7/6/92	7/24/92	Task	15	05		
239	140526-TAM DELIVER - PRI AIR FANS TO AH - PM 07/06/92	TAM-2	7/7/92	7/7/92	Milestone	0	02		
240	T/R TO 07/07/92 FOR START OF SCH INT MASONRY	4	7/7/92	7/7/92	Milestone	0	04		
241	T/R TO AM 07/07/92	TAM-5	7/7/92	7/7/92	Task	0	05		
242	T/R TO START OF GEC GENERAL ELECTRIC MOBILIZATION - 07/07/92	GEC-4	7/7/92	7/7/92	Milestone	0	04		
243	010005-GEC GENERAL ELECTRIC MOBILIZATION - 4	GEC-4	7/7/92	7/10/92	Milestone	4	04		
244	140190-TAM ERECT - FURN SW LOWER HDR - 4	TAM-2	7/7/92	7/10/92	Task	4	02		
245	140204-TAM ROUGH ERECT DUCT - PRI AIR FANS TO AH - 5	TAM-2	7/7/92	7/13/92	Task	5	02		
246	030005-SCH - INTERIOR MASONRY WALLS - 11	SCH-4	7/7/92	7/21/92	Milestone	11	04		
247	130030-FAI INSTALL NEW BUNKER FEED BELT CONVEYOR - 2-15/E-F - 24	FAI-5	7/7/92	8/7/92	Task	24	05		
248	140178-TAM INSTALL SUPERHEAT BOILER HANGERS - 5	TAM-2	7/8/92	7/14/92	Task	5	02		
249	140212-TAM UREA INTERCONNECTING PIPING - 9	TAM-2	7/10/92	7/22/92	Task	9	02		
250	060005-CEI PART CHEM/ELECTRICAL BUILDING ROOFING - 0	CEI-4	7/13/92	7/13/92	Milestone	0	04		
251	140528-TAM DELIVER DUCT - SECONDARY AIR FAN TO AH - PM 07/10/92	TAM-2	7/13/92	7/13/92	Milestone	0	02		
252	180002-DFIE DFIE - PART ELECTRICAL - 0	DFIE-4	7/13/92	7/13/92	Task	0	04		
253	190005-QUAL QUALITY - PART ELECT MACHINERY HOOK-UP - 0	QUAL-4	7/13/92	7/13/92	Task	0	04		
254	T/R TO START INTERIOR BUILDING CAULKING & SEALING - 07/13/92	WES-4	7/13/92	7/13/92	Milestone	0	04		
255	T/R TO START OF ZACK COMPANY MOBILIZATION - 07/13/92	ZAC-4	7/13/92	7/13/92	Milestone	0	04		
256	040010-GJOH INSTALL INTERIOR MISC. STEEL - 2	GJOH-4	7/13/92	7/14/92	Milestone	2	04		
257	060005-CEI CHEM / ELECTRICAL BUILDING ROOFING - 4	CEI-4	7/13/92	7/16/92	Milestone	4	04		
258	060005A-CEI COMP CHEM/ELECTRICAL BUILDING ROOFING - 4	CEI-4	7/13/92	7/16/92	Milestone	4	04		
259	050001-ZAC ZACK COMPANY MOBILIZATION - 5	ZAC-4	7/13/92	7/17/92	Milestone	5	04		
260	140202-TAM FURNISH SW TUBE WELD LOWER TO HDR - 6	TAM-2	7/13/92	7/20/92	Task	6	02		
261	010010-GEC TURBINE - PART INSTALL SOLE PLATES - 10	GEC-4	7/13/92	7/24/92	Milestone	10	04		

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
262	180002-DFIE DFIE - COMP ELECTRICAL - 10	DFIE-4	7/13/92	7/24/92	Task	10	04		
263	190005A-QUAL QUALITY - COMP ELECT MACHINERY HOOK-UP - 10	QUAL-4	7/13/92	7/24/92	Task	10	04		
264	070010-WES INTERIOR BUILDING CAULK & SEALANT - 50	WES-4	7/13/92	9/21/92	Milestone	50	04		
265	140214-TAM ROUGH ERECT DUCT - SEC AIR FAN TO AH - 4	TAM-2	7/14/92	7/17/92	Task	4	02		
266	140184-TAM ERECT - UPPER SH WALL RING HEADER - 3	TAM-2	7/15/92	7/17/92	Task	3	02		
267	140182-TAM WELD FURN RW MIDDLE TUBE - 7	TAM-2	7/15/92	7/23/92	Task	7	02		
268	115002-GMID CHEM/ELEC. PAINTING & SEAL FLOOR - 15	GMID-4	7/15/92	8/4/92	Milestone	15	04		
269	140530-TAM DELIVER - SUPERHEATER, PRIM & INT ELEMENTS - PM 07/15/92	TAM-3	7/16/92	7/16/92	Milestone	0	03		
270	140230-TAM GROUND ASSEMBLE - INTERM SH ELEMENTS - 3	TAM-3	7/16/92	7/20/92	Milestone	3	03		
271	140228-TAM GROUND ASSEMBLE - PRIMARY SH ELEMENT - 15	TAM-3	7/16/92	8/5/92	Milestone	15	03		
272	140532-TAM DELIVER - NON METAL AIR DUCT EXP JOINT - PM 07/16/92	TAM-3	7/17/92	7/17/92	Milestone	0	03		
273	140534-TAM DELIVER - PENTHOUSE - PM 07/17/92	TAM-3	7/20/92	7/20/92	Milestone	0	03		
274	140232-TAM ROUGH SET DAMPERS - 2	TAM-3	7/20/92	7/21/92	Milestone	2	03		
275	140192-TAM ERECT - SH SIDE WALL PANELS - 4	TAM-2	7/20/92	7/23/92	Task	4	02		
276	140234-TAM ROUGH SET - NON METAL AIR DUCTS EXP JOINTS - 4	TAM-3	7/20/92	7/23/92	Milestone	4	03		
277	140234-TAM ROUGH SET - NON METAL AIR DUCTS EXP JOINTS - 4	TAM-2	7/20/92	7/23/92	Task	4	02		
278	050002-ZAC PART INTERIOR METAL WALL ELEV. 875 & 891 - 6	ZAC-4	7/20/92	7/27/92	Milestone	6	04		
279	136025-THE - PART COOLING TOWER DISTRIBUTION - 1	THE-5	7/21/92	7/21/92	Task	1	05		
280	136005A-THE - COMP COOLING TOWER STRUCTURAL FRAMING - 5	THE-5	7/21/92	7/27/92	Task	5	05		
281	136010-THE - COOLING TOWER PARTITION WALLS - 6	THE-5	7/21/92	7/28/92	Task	6	05		
282	030010-SCH EAST ELEV MASONRY 851 TO 905 - 2	SCH-4	7/22/92	7/23/92	Milestone	2	04		
283	136025-THE - COMP COOLING TOWER DISTRIBUTION - 5	THE-5	7/22/92	7/28/92	Task	5	05		
284	136020-THE - COOLING TOWER FILL - 12	THE-5	7/22/92	8/6/92	Task	12	05		
285	140536-TAM DELIVER - FLUOSEAL DUCT - PM 07/22/92	TAM-3	7/23/92	7/23/92	Milestone	0	03		
286	140240-TAM FLUOSEAL DUCT - 4	TAM-3	7/23/92	7/28/92	Milestone	4	03		
287	030015-SCH EAST ELEV STONE 851 TO 905 - 2	SCH-4	7/24/92	7/27/92	Milestone	2	04		
288	030020-SCH EAST ELEV MASONRY 851 TO 967 - 2	SCH-4	7/24/92	7/27/92	Milestone	2	04		
289	140194-TAM ERECT - SH FRONT WALL PANEL - 3	TAM-2	7/24/92	7/28/92	Task	3	02		
290	140242-TAM ROUGH SET - SECONDARY AIR FAN - 4	TAM-3	7/24/92	7/29/92	Milestone	4	03		

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
291	140220-TAM ERECT - FLOOR PLENUM - 9	TAM-2	7/24/92	8/5/92	Task	9	02		
292	010010A-GEC TURBINE - COMP INSTALL SOLE PLATES - 5	GEC-4	7/27/92	7/31/92	Milestone	5	04		
293	010015-PART GEC TURBINE - SETUP AND INSTALL TB GENERATOR - 10	GEC-4	7/27/92	8/7/92	Milestone	10	04		
294	130045-FAI DELIVER EXISTING PURGE CONVEYOR DISCHARGE - 15	FAI-5	7/27/92	8/14/92	Task	15	05		
295	130040-FAI INSTALL BUNKER PURGE CONVEYOR - 10-15/E-F - 30	FAI-5	7/27/92	9/4/92	Task	30	05		
296	140538-TAM DELIVER INSTRUMENTS & CONTROLS - PM 07/27/92	TAM-3	7/28/92	7/28/92	Milestone	0	03		
297	030025-SCH EAST ELVE STONE 851 TO 967 - 2	SCH-4	7/28/92	7/29/92	Milestone	2	04		
298	136035-THE - PART COOLING TOWER DECK FAN - 5	THE-5	7/28/92	8/3/92	Task	5	05		
299	030055-SCH WEST ELEVATION MASONRY F-K - 10	SCH-4	7/28/92	8/10/92	Milestone	10	04		
300	050002-ZAC COMP INTERIOR METAL WALL ELEV. 875 & 891 - 11	ZAC-4	7/28/92	8/11/92	Milestone	11	04		
301	050004-ZAC INTERIOR METAL WALL ELEV. 894 & 912 - 11	ZAC-4	7/28/92	8/11/92	Milestone	11	04		
302	030035-SCH SOUTH ELEVATION MASONRY - 12	SCH-4	7/28/92	8/12/92	Milestone	12	04		
303	140250-TAM MISC INSTRUMENT PIPING - 28	TAM-3	7/28/92	9/3/92	Milestone	28	03		
304	140252-TAM ROUGH SET - LOOP SEAL EXPANSION JOINT - 2	TAM-3	7/29/92	7/30/92	Milestone	2	03		
305	140210-TAM ERECT - SH REAR WALL PANEL - 4	TAM-2	7/29/92	8/3/92	Task	4	02		
306	136015-THE - COOLING TOWER WIND WALLS - 6	THE-5	7/29/92	8/5/92	Task	6	05		
307	140254-TAM ROUGH SET - SECONDARY AIR FAN DRIVE - 2	TAM-3	7/30/92	7/31/92	Milestone	2	03		
308	140260-TAM ERECT CYCLONE - 8	TAM-3	7/31/92	8/11/92	Milestone	8	03		
309	135005-MOR PART INSTALL SILO FILL AREA SPRINKLER PIPING - 0	MOR-5	8/3/92	8/3/92	Task	0	05		
310	T/R TO START OF SILO FILL AREA SPRINKLER PIPING - 08/03/92	MOR-5	8/3/92	8/3/92	Task	0	05		
311	140262-TAM ROUGH SET - PRIMARY AIR FAN - 8	TAM-3	8/3/92	8/12/92	Milestone	8	03		
312	135005A-MOR COMP INSTALL SILO FILL AREA SPRINKLER PIPING - 15	MOR-5	8/3/92	8/21/92	Task	15	05		
313	140264-TAM ERECT - SECONDARY AIR FAN - 20	TAM-3	8/3/92	8/28/92	Milestone	20	03		
314	135010-MOR INSTALL EXISTING COAL CONVEYOR SPRINKLER PIPING - 22	MOR-5	8/3/92	9/1/92	Task	22	05		
315	136035A-THE - COMP COOLING TOWER DECK FAN - 2	THE-5	8/4/92	8/5/92	Task	2	05		
316	140218-TAM ERECT - INT SH OUTLET HEADER - 2	TAM-3	8/4/92	8/5/92	Milestone	2	03		
317	140216-TAM ERECT - LOWER SH WALL RING HDR - 3	TAM-2	8/4/92	8/6/92	Task	3	02		
318	136050-THE - PART COOLING TOWER CASING - 5	THE-5	8/4/92	8/10/92	Task	5	05		
319	136040-THE - COOLING TOWER MECHANICAL - 7	THE-5	8/4/92	8/12/92	Task	7	05		

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
320	000002-MILE CHEM/ELECTRICAL BUILDING COMPLETE - 1	MILE-4	8/5/92	8/5/92	Milestone	1	04		
321	136055-THE - COOLING TOWER STAIR TOWER - 4	THE-5	8/6/92	8/11/92	Task	4	05		
322	136045-THE - COOLING TOWER FAN STACKS - 6	THE-5	8/6/92	8/13/92	Task	6	05		
323	140246-TAM ERECT ROOF PANELS - 8	TAM-3	8/6/92	8/17/92	Milestone	8	03		
324	140248-TAM TUBE WELD 3.0 X .220 CS FLR PLENUM - 15	TAM-3	8/6/92	8/26/92	Milestone	15	03		
325	136030-THE - COOLING TOWER DRIFT ELIMINATORS - 4	THE-5	8/7/92	8/12/92	Task	4	05		
326	140244-TAM TUBE WELD 1.5 X .180 SH SIDE PNL - 4	TAM-3	8/7/92	8/12/92	Milestone	4	03		
327	140224-TAM TUBE WELD 1.5 X .180 SH REAR PNL - 5	TAM-3	8/7/92	8/13/92	Milestone	5	03		
328	140222-TAM ERECT DUCT - SH TO ECON DUCT - 6	TAM-3	8/7/92	8/14/92	Milestone	6	03		
329	140238-TAM TUBE WELD 1.5 X .180 SH SIDE PNL - 8	TAM-3	8/7/92	8/18/92	Milestone	8	03		
330	140226-TAM WELD SH MEMBRANE - 9	TAM-3	8/7/92	8/19/92	Milestone	9	03		
331	140540-TAM DELIVER - SUPERHEATER, FIN ELEMENTS - PM 08/07/92	TAM-3	8/10/92	8/10/92	Milestone	0	03		
332	010015A-COMP GEC TURBINE - SETUP AND INSTALL TB GENERATOR - 5	GEC-4	8/10/92	8/14/92	Milestone	5	04		
333	010020-GEC TURBINE - INSTALL M.S.V. - 5	GEC-4	8/10/92	8/14/92	Milestone	5	04		
334	136050A-THE - COMP COOLING TOWER CASING - 2	TH3-5	8/11/92	8/12/92	Task	2	05		
335	030060-SCH WEST ELEVATION STONE F-K - 9	SCH-4	8/11/92	8/21/92	Milestone	9	04		
336	030065-SCH WEST ELEVATION MASONRY A-F - 20	SCH-4	8/11/92	9/8/92	Milestone	20	04		
337	140542-TAM DELIVER - CYCLONE OUTLET DUCT - PM 08/11/92	TAM-3	8/12/92	8/12/92	Milestone	0	03		
338	136060-THE - COOLING TOWER ESCAPE LADDER - 3	THE-5	8/12/92	8/14/92	Task	3	05		
339	140282-TAM 5.5' DIA LOOP SEAL DOWNCOMER - 5	TAM-3	8/12/92	8/18/92	Milestone	5	03		
340	140280-TAM INSTALL - CYCLONE OUTLET DUCT - 6	TAM-3	8/12/92	8/19/92	Milestone	6	03		
341	050006-ZAC INTERIOR METAL WALL ELEV. 930 & 945 - 8	ZAC-4	8/12/92	8/21/92	Milestone	8	04		
342	140286-TAM ROUGH SET - PRIMARY AIR FAN DRIVE - 2	TAM-3	8/13/92	8/14/92	Milestone	2	03		
343	030040-SCH SOUTH ELEVATION STONE - 13	SCH-4	8/13/92	8/31/92	Milestone	13	04		
344	140284-TAM ERECT - PRIMARY AIR FAN - 28	TAM-3	8/13/92	9/22/92	Milestone	28	03		
345	010025-GEC TURBINE - SET LUBE OIL TANK - 2	GEC-4	8/17/92	8/18/92	Milestone	2	04		
346	136065-THE - PART COOLING TOWER MISCELLANEOUS - 2	THE-5	8/17/92	8/18/92	Task	2	05		
347	140288-TAM ROUGH SET - FURN DW - 2	TAM-3	8/18/92	8/19/92	Milestone	2	03		
348	140270-TAM WELD 3.0 X .220 CS ROOF TUBE - 11	TAM-3	8/18/92	9/1/92	Milestone	11	03		

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	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
349	136065A-THE - COMP COOLING TOWER MISCELLANEOUS - 1	THE-5	8/19/92	8/19/92	Task	1	05		
350	140312-TAM ERECT LOOP SEAL EXPANSION JOINT - 4	TAM-3	8/19/92	8/24/92	Milestone	4	03		
351	010030-PART GEC TURBINE - INSTALL STEAM PIPING - 5	GEC-4	8/19/92	8/25/92	Milestone	5	04		
352	140258-TAM ERECT - HEAT RECOVERY AREA BUCKSTAYS - 6	TAM-3	8/19/92	8/26/92	Milestone	6	03		
353	136070-THE - COOLING TOWER CLEAN UP / DEMOBILIZATION - 1	THE-5	8/20/92	8/20/92	Task	1	05		
354	140274-TAM ERECT - FURN DW LOPWER HDR - 3	TAM-3	8/20/92	8/24/92	Milestone	3	03		
355	140256 - TAM ERECT - INTERM SH ELEMENTS - 4	TAM-3	8/20/92	8/25/92	Milestone	4	03		
356	140314-TAM CYCLONE OUTLET EXPANSION JOINT - 4	TAM-3	8/20/92	8/25/92	Milestone	4	03		
357	140276-TAM ROUGH SET - RISER PIPE - 5	TAM-3	8/20/92	8/26/92	Milestone	5	03		
358	T/R TO AM 08/24/92	TAM-5	8/24/92	8/24/92	Task	0	05		
359	050008-ZAC INTERIOR METAL WALL ELEV. 955 & 963 - 24	ZAC-4	8/24/92	9/25/92	Milestone	24	04		
360	130050-FAI INSTALL EXISTING PURGE CONVEYOR DISCHARGE - 25	FAI-5	8/24/92	9/28/92	Task	25	05		
361	030070-SCH WEST ELEVATION STONE A-F - 26	SCH-4	8/24/92	9/29/92	Milestone	26	04		
362	140290-TAM FURN DW LOWER WELD TO HDR - 7	TAM-3	8/25/92	9/2/92	Milestone	7	03		
363	140266-TAM WELD 2.25 X .180 INT SH ELEMENTS - 4	TAM-3	8/26/92	8/31/92	Milestone	4	03		
364	010035-PART GEC TURBINE - INSTALL LUBE OIL PIPING - 5	GEC-4	8/26/92	9/1/92	Milestone	5	04		
365	010030A-COMP GEC TURBINE - INSTALL STEAM PIPING - 15	GEC-4	8/26/92	9/16/92	Milestone	15	04		
366	140310-TAM ROUGH SET - PENTHOUSE CASING - 2	TAM-3	8/27/92	8/28/92	Milestone	2	03		
367	140296-TAM ERECT-CYCLONE INLET EXPANSION JOINT - 4	TAM-3	8/27/92	9/1/92	Milestone	4	03		
368	140272-TAM ERECT - PRIMARY SH ELEMENTS - 5	TAM-3	8/27/92	9/2/92	Milestone	5	03		
369	140298-TAM ERECT - FLUOSEAL DISCHARGE LEG - 8	TAM-3	8/27/92	9/8/92	Milestone	8	03		
370	140306-TAM ERECT - DOWNCOMBER PIPE - 8	TAM-3	8/27/92	9/8/92	Milestone	8	03		
371	140302-TAM COAL CHUTES - 15	TAM-3	8/27/92	9/17/92	Milestone	15	03		
372	140308-TAM ERECT - RISER PIPE - 20	TAM-3	8/27/92	9/24/92	Milestone	20	03		
373	140304-TAM FURNACE MEMBRANE WELDING - 40	TAM-3	8/27/92	10/22/92	Milestone	40	03		
374	140332-TAM ERECT - SECONDARY AIR FAN DRIVE - 3	TAM-3	8/31/92	9/2/92	Milestone	3	03		
375	140330-TAM DUCT - SEC AIR FAN TO AH - 20	TAM-3	8/31/92	9/28/92	Milestone	20	03		
376	140278-TAM ERECT - FIN IN/OUT HEADER - 2	TAM-3	9/1/92	9/2/92	Milestone	2	03		
377	135015-MOR INSTALL FIRE & JOCKEY PUMPS - 5	MOR-5	9/2/92	9/9/92	Task	5	05		

listed in es, ef, activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
378	010040-GEC TURBINE - PART ALIGN TO GENERATOR - 10	GEC-4	9/2/92	9/16/92	Milestone	10	04		
379	010035A-COMP GEC TURBINE - INSTALL LUBE OIL PIPING - 15	GEC-4	9/2/92	9/23/92	Milestone	15	04		
380	140300-TAM LIMESTONE PNEUMATIC PIPE - 18	TAM-3	9/2/92	9/28/92	Milestone	18	03		
381	1/R TO START OF NORTH ELEVATION MASONRY 851 TO 967 - 09/03/92	SCH-4	9/3/92	9/3/92	Milestone	0	04		
382	140294-TAM ERECT - FINISHING SH ELEMENTS - 6	TAM-3	9/3/92	9/11/92	Milestone	6	03		
383	140316-TAM ERECT - DIVISION WALLS - 10	TAM-3	9/3/92	9/17/92	Milestone	10	03		
384	030045-SCH NORTH ELEVATION MASONRY 851 TO 967 - 12	SCH-4	9/3/92	9/21/92	Milestone	12	04		
385	140288-TAM ERECT - SH LINK PIPE - 14	TAM-3	9/3/92	9/23/92	Milestone	14	03		
386	140292-TAM WELD 2.25 X .180 PRI SH ELEMENTS - 17	TAM-3	9/3/92	9/28/92	Milestone	17	03		
387	135020-MOR PART INSTALL FIRE PUMP SUCTION PIPING - 0	MOR-5	9/9/92	9/9/92	Task	0	05		
388	030075-SCH WEST ELEVATION MASONRY A-AA - 2	SCH-4	9/9/92	9/10/92	Milestone	2	04		
389	140328-TAM WELD 12" SCH 80 X 106B DOWNCOMER - 8	TAM-3	9/9/92	9/18/92	Milestone	8	03		
390	050010-ZAC EAST ELEVATION METAL WALL PANELS - 10	ZAC-4	9/9/92	9/22/92	Milestone	10	04		
391	135020A-MOR COMP INSTALL FIRE PUMP SUCTION PIPING - 5	MOR-5	9/10/92	9/16/92	Task	5	05		
392	135025-MOR INSTALL FIRE PUMP DISCHARGE PIPING - 5	MOR-5	9/10/92	9/16/92	Task	5	05		
393	140318-TAM ERECT - SH ROOF PANEL - 2	TAM-3	9/14/92	9/15/92	Milestone	2	03		
394	140322-TAM ERECT - RETRACTABLE SOOT BLOWERS - 10	TAM-3	9/14/92	9/25/92	Milestone	10	03		
395	140320-TAM WELD 2.25 X .180 FIN SH ELEMENTS - 12	TAM-3	9/14/92	9/29/92	Milestone	12	03		
396	140324-TAM CRANE COMPLETE - 1	TAM-3	9/16/92	9/16/92	Milestone	1	03		
397	140326-TAM TUBE WELD 1.5 X .180 SH ROOF PNL - 5	TAM-3	9/16/92	9/22/92	Milestone	5	03		
398	010040A-GEC TURBINE - CONT(1) ALIGN TO GENERATOR - 5	GEC-4	9/17/92	9/23/92	Milestone	5	04		
399	010045-PART GEC TURBINE - INSTALL J-BOS, PT & SCT CABINETS - 5	GEC-4	9/17/92	9/23/92	Milestone	5	04		
400	135030-MOR INSTALL TURBINE BULD. HEADERS / RUNOUTS TO HOSE ST - 15	MOR-5	9/17/92	10/7/92	Task	15	05		
401	140338-TAM WELD 10" SCH 80 X 106B DOWNCOMER - 5	TAM-3	9/21/92	9/25/92	Milestone	5	03		
402	030050-SCH NORTH ELEVATION STONE 851 TO 967 - 14	SCH-4	9/22/92	10/9/92	Milestone	14	04		
403	140348-TAM ERECT - PRIMARY AIR FAN DRIVE - 4	TAM-3	9/23/92	9/28/92	Milestone	4	03		
404	070015-WES CAULK EXTERIOR EAST ELEVATION - 5	WES-4	9/23/92	9/29/92	Milestone	5	04		
405	050015-ZAC SOUTH ELEVATION METAL WALL PANELS - 7	ZAC-4	9/23/92	10/1/92	Milestone	7	04		
406	140346-TAM ERECT DUCT - PRIMARY AIR FANS TO AH - 20	TAM-3	9/23/92	10/20/92	Milestone	20	03		

listed in es, ef, activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s #	comp	status as of
407	010040B-GEC TURBINE - COMP ALIGN TO GENERATOR - 5	GEC-4	9/24/92	9/30/92	Milestone	5	04		
408	010045A-COMP GEC TURBINE - INSTALL J-BOS, PT & SCT CABINETS - 5	GEC-4	9/24/92	9/30/92	Milestone	5	04		
409	140334-TAM WELD 10" SCH 80 CS SH LINK PIPE - 13	TAM-3	9/24/92	10/12/92	Milestone	13	03		
410	010065-GEC TURBINE - HARDWIRE PT & CTS - 30	GEC-4	9/24/92	11/4/92	Milestone	30	04		
411	140342-TAM WELD 10" SCH 80 X 106B RISER - 18	TAM-3	9/25/92	10/20/92	Milestone	18	03		
412	140344-TAM WELD 8" SCH 80 X 106B DOWNCOMER - 4	TAM-3	9/28/92	10/1/92	Milestone	4	03		
413	140336-TAM ERECT - SOOT BLOWER PIPING - 26	TAM-3	9/28/92	11/2/92	Milestone	26	03		
414	140352-TAM BEARING COOL WATER PIPING - 4	TAM-3	9/29/92	10/2/92	Milestone	4	03		
415	030080-SCH WEST ELEVATION STONE A-AA - 2	SCH-4	9/30/92	10/1/92	Milestone	2	04		
416	140340-TAM EH HDR ENCLR CASING - 25	TAM-3	9/30/92	11/3/92	Milestone	25	03		
417	010050-GEC TURBINE - INSTALL MOTOR CONTROL CENTER - 5	GEC-4	10/1/92	10/7/92	Milestone	5	04		
418	010055-GEC TURBINE - INSTALL PIPING AND VALVES - 5	GEC-4	10/1/92	10/7/92	Milestone	5	04		
419	010060-PART GEC TURBINE - HARDWIRE CONTROL SYSTEM - 15	GEC-4	10/1/92	10/21/92	Milestone	15	04		
420	070020-WES CAULK EXTERIOR SOUTH ELEVATION - 5	WES-4	10/2/92	10/8/92	Milestone	5	04		
421	050025-ZAC WEST ELEVATION METAL WALL PANELS - 10	ZAC-4	10/2/92	10/15/92	Milestone	10	04		
422	T/R TO START INSTALL EXTERIOR WINDOWS EAST ELEVATION - 10/05/92	ABP-4	10/5/92	10/5/92	Milestone	0	04		
423	T/R TO START OF ROOFING MOBILIZATION - 10/05/92	CEI-4	10/5/92	10/5/92	Milestone	0	04		
424	060001-CEI CEI ROOFING MOBILIZATION - 5	CEI-4	10/5/92	10/9/92	Milestone	5	04		
425	100005-ABP INSTALL EXTERIOR WINDOWS EAST ELEVATION - 5	ABP-4	10/5/92	10/9/92	Milestone	5	04		
426	135035-MOR INSTALL BOILER BULD. HEADERS / RUNOUTS TO HOSE ST - 15	MOR-5	10/8/92	10/28/92	Task	15	05		
427	100010-ABP INSTALL EXTERIOR WINDOWS SOUTH ELEVATION - 5	ABP-4	10/12/92	10/16/92	Milestone	5	04		
428	060010-CEI GENERAL BUILDING ROOF COL. F - K @ 922.5 - 6	CEI-4	10/12/92	10/19/92	Milestone	6	04		
429	140350-TAM WELD 10" X 1.25 P11 SH LINK PIPE - 5	TAM-3	10/13/92	10/19/92	Milestone	5	03		
430	070030-WES CAULK EXTERIOR WEST ELEVATION - 5	WEX-4	10/16/92	10/22/92	Milestone	5	04		
431	050020-ZAC NORTH ELEVATION METAL WALL PANELS - 7	ZAC-4	10/16/92	10/26/92	Milestone	7	04		
432	100015-ABP INSTALL EXTERIOR WINDOWS NORTH ELEVATION - 5	ABP-4	10/19/92	10/23/92	Milestone	5	04		
433	060015-CEI GENERAL BUILDING ROOF COL. E - F @ 967 - 3	CEI-4	10/20/92	10/22/92	Milestone	3	04		
434	140354-TAM MISC TRIM PIPING - 40	TAM-3	10/20/92	12/15/92	Milestone	40	03		
435	140356-TAM WELD 8" SCH 80 X 106B RISER - 14	TAM-3	10/21/92	11/9/92	Milestone	14	03		

listed in es, ef, activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s#	comp	status as of
436	010060A-COMP GEC TURBINE - HARDWIRE CONTROL SYSTEM - 5	GEC-4	10/22/92	10/28/92	Milestone	5	04		
437	010070-PART GEC TURBINE - PIPE FOR STEAM BLOW DOWN / BLOW DOWN - 10	GEC-4	10/22/92	11/4/92	Milestone	10	04		
438	060020-CEI GENERAL BUILDING ROOF COL. E - A @ 977-9 - 7	CEI-4	10/23/92	11/2/92	Milestone	7	04		
439	140358-TAM ERECT DUCT - SEC AIR AH TO BUSTLE - 15	TAM-3	10/23/92	11/12/92	Milestone	15	03		
440	140360-TAM GRIND INSIDE COMBUSTOR - 15	TAM-3	10/23/92	11/12/92	Milestone	15	03		
441	100020-ABP INSTALL EXTERIOR WINDOWS WEST ELEVATION - 5	ABP-4	10/26/92	10/30/92	Milestone	5	04		
442	070025-WES CAULK EXTERIOR NORTH ELEVATION - 5	WES-4	10/27/92	11/2/92	Milestone	5	04		
443	135040-MOR INSTALL VALVE STATIONS - 5	MOR-5	10/29/92	11/4/92	Task	5	05		
444	060025-CEI GENERAL BUILDING ROOF COL. A - AA @ 904 - 1	CEI-4	11/3/92	11/3/92	Milestone	1	04		
445	140362-TAM HYDRO TEST - SOOT BLOWER PIPING - 2	TAM-3	11/3/92	11/4/92	Milestone	2	03		
446	000001- MILE BUILDING ENCLOSURE COMPLETE - 1	MILE-4	11/4/92	11/4/92	Milestone	1	04		
447	010070A-COMP GEC TURBINE - PIPE FOR STEAM BLOW DOWN / BLOW DOWN - 5	GEC-4	11/5/92	11/11/92	Milestone	5	04		
448	010075-GEC TURBINE - PIPE COOLING WATER - 10	GEC-4	11/5/92	11/18/92	Milestone	10	04		
449	135045-MOR INSTALL TURBINE UNDERFLOOR SPRINKLER PIPE - 14	MOR-5	11/5/92	11/24/92	Task	14	05		
450	140368-TAM FLOW ELEMENTS - 2	TAM-3	11/13/92	11/16/92	Milestone	2	03		
451	140372-TAM INSTALL UREA INJECTION NOZZLES - 4	TAM-3	11/13/92	11/18/92	Milestone	4	03		
452	140428-TAM REFRACTORY MOBILIZATION - 5	TAM-3	11/13/92	11/19/92	Milestone	5	03		
453	140366-TAM 6" OFA NOZZLES - 6	TAM-3	11/13/92	11/20/92	Milestone	6	03		
454	140370-TAM NON METAL AIR DUCTS EXPANSION JOINTS - 8	TAM-3	11/13/92	11/24/92	Milestone	8	03		
455	140374-TAM UREA PIPING TO COMBUSTOR & CYCLONES - 12	TAM-3	11/19/92	12/7/92	Milestone	12	03		
456	010080-GEC TURBINE - SYSTEMS CHECK OUT - 30	GEC-4	11/19/92	1/4/93	Milestone	30	04		
457	140426-TAM STUD MEMBRANE WALLS - 5	TAM-3	11/20/92	11/27/92	Milestone	5	03		
458	140376-TAM ERECT - OFA DUCT BUSTLE TO BURNERS - 10	TAM-3	11/23/92	12/7/92	Milestone	10	03		
459	135050-MOR PART INSTALL TURBINE / GENERATOR BEARING SYSTEM - 14	MOR-5	11/25/92	12/15/92	Task	14	05		
460	140420-TAM STUD SUPERHEATER - 10	TAM-3	11/30/92	12/11/92	Milestone	10	03		
461	140424-TAM REFRACTORIZE CYCLONE - 30	TAM-3	11/30/92	1/12/93	Milestone	30	03		
462	140380-TAM UREA SYSTEM COMPLETE - 1	TAM-3	12/8/92	12/8/92	Milestone	1	03		
463	140384-TAM ERECT - DAMPERS - 4	TAM-3	12/8/92	12/11/92	Milestone	4	03		
464	140382-TAM ERECT DUCT - GAS GUN PURGE AIR -6	TAM-3	12/8/92	12/15/92	Milestone	6	03		

listed in es, ef, activity number sequence

	activity	sub title	earliest start	earliest finish	type	days	s#	comp	status as of
465	140386-TAM NON METAL AIR DUCTS EXPANSION JOINTS - 10	TAM-3	12/8/92	12/21/92	Milestone	10	03		
466	140388-TAM DAMPERS ACTUATORS - 5	TAM-3	12/14/92	12/18/92	Milestone	5	03		
467	140378-TAM HYDROSTATIC TEST - 4	TAM-3	12/16/92	12/21/92	Milestone	4	03		
468	140398-TAM ERECT - BURNERS & PREPIPED RACKS - 12	TAM-3	12/16/92	1/4/93	Milestone	12	03		
469	135050A-MOR COMP INSTALL TURBINE / GENERATOR BEARING SYSTEM - 14	MOR-5	12/16/92	1/6/93	Task	14	05		
470	140394-TAM ACCESS DOORS/PORTS - 5	TAM-3	12/22/92	12/29/92	Milestone	5	03		
471	140422-TAM METAL SPRAY - 10	TAM-3	12/22/92	1/6/93	Milestone	10	03		
472	140392-TAM PENTHOUSE CASING - 30	TAM-3	12/22/92	2/3/93	Milestone	30	03		
473	140390-TAM INSTRUMENTATION / CONTROLS - 80	TAM-3	12/22/92	4/14/93	Milestone	80	03		
474	140400-TAM AIR TEST - 4	TAM-3	12/30/92	1/5/93	Milestone	4	03		
475	140406-TAM GAS & AIR PIPING - 15	TAM-3	1/5/93	1/25/93	Milestone	15	03		
476	135055-MOR PART INSTALL HOSE RACKS - 0	MOR-5	1/6/93	1/6/93	Task	0	05		
477	140402-TAM INSULATION / LAGGING - 78	TAM-3	1/6/93	4/23/93	Milestone	78	03		
478	135055A-MOR COMP INSTALL HOSE RACKS - 5	TAM-5	1/7/93	1/13/93	Task	5	05		
479	140418-TAM REFRACTORIZE COMBUSTOR - 15	TAM-3	1/7/93	1/27/93	Milestone	15	03		
480	T/R TO AM 01/11/93	TAM-5	1/11/93	1/11/93	Task	0	05		
481	135060-MOR INSTALL FIRE PANELS AND EQUIPMENT - 5	MOR-5	1/11/93	1/15/93	Task	5	05		
482	135065-MOR INSTALL AND WIRE ALARM SYSTEM - 25	MOR-5	1/18/93	2/19/93	Task	25	05		
483	140408-TAM GAS LANCES - 10	TAM-3	1/26/93	2/8/93	Milestone	10	03		
484	140416-TAM REFRACTORIZE FLUOSEAL - 5	TAM-3	1/28/93	2/3/93	Milestone	5	03		
485	140412-TAM REFRACTORY CURE-OUT - 5	TAM-3	2/4/93	2/10/93	Milestone	5	03		
486	140414-TAM CHEMICAL CLEANING - 5	TAM-3	2/11/93	2/17/93	Milestone	5	03		
487	135070-MOR TEST AND CHECK OUT FIRE ALARM SYSTEM - 5	MOR-5	2/22/93	2/26/93	Task	5	05		
488	135075 - MOR COMMISSION FIRE PROTECTION SYSTEM - 1	MOR-5	3/1/93	3/1/93	Task	1	05		
489	140410-TAM COMPLETE - 1	TAM-3	4/26/93	4/26/93	Milestone	1	03		

Ralph J. Stephenson P.E. P.C.
Consulting Engineer

a:mpp0226 - Notes re network modeling and scheduling MSU PP #4 - February 26, 1992 - Detroit, Michigan

On Thursday, February 20, 1992, I worked at MSU on the Power Plant planning program with various members of the project team. The early part of the day was spent with Dick Wever and Jim Simons. This session was devoted to a review of my position on the project. We also discussed what role Dick and Jim wished me to play in the planning and scheduling review to be held with A/C to be held later that day.

Dick and Jim feel that I am to represent MSU in setting planning and scheduling procedures and in preparation, monitoring and evaluating work plans by the various parties to the project. This work is to be done from project plans and schedules prepared by A/C and others and submitted to Jim Simons. If appropriate and if acceptable by A/C for me to participate in the planning process which they use, I will also be present and provide input during these sessions in whatever way MSU or A/C feel is helpful.

In the event A/C has difficulty in obtaining the cooperation of the various design, fabricate, install (dfi) contractors under contract to MSU, I may also be called on, along with Jim Simons and Dick Wever, to assist to get the information needed to properly plan and schedule the work.

We all agreed that this is a work method that will be most effective and helpful serving the interests of all involved.

Later, on February 20, 1992 I continued with my work on the network models from the Issue #1 Prima Vera runs of A/C while Dick and Jim attended the construction meeting. After the meeting they came back to the conference room with John Wieland, John Clark, Dave Sadler, John Hucul and Jim Cornillie for a further review of the planning and scheduling work. This was to have the conference originally set for 1:30 PM.

Our discussion in this meeting was congenial and during the session the mode of operation as expressed earlier and outlined above was reviewed in detail. Stress was placed on insuring that the privilege and responsibility for planning the project was primarily to be assumed by A/C. There was no detailed review of any of the work by A/C to date.

I shall continue to work with Jim Simons and as needed, John Hucul of A/C to give MSU planning and monitoring documents as needed for the owner to properly and accurately follow the work of the various organizations on the project.

Ralph J. Stephenson, P. E.

Monday, November 11, 1991 (476)

- I. T. B. Simon Power Plant Unit 4 Addition notes**
 - A. Prepared November 18, 1991 (481)**
- II. By Ralph J. Stephenson**
- III. Meeting date - Monday November 11, 1991 (476)**
 - A. Notes prepared Monday, 11/18/91 (476)**
- IV. Location - MSU Power Plant field office**
- V. Those attending**
 - A. Dick Wever - MSU construction superintendent**
 - B. Jim Simons - MSU project representative**
 - C. Rick Johnson - Electrical engineer - MSU power plant**
 - D. David Sanger - MSU student employee - field office - in meeting part time**
 - E. Ralph J. Stephenson - Consultant**
- VI. Agenda**
 - A. Review documentation concepts**
 - B. Walk through one month of documentation**
- VII. Meeting notes**
 - A. Discussed concepts of documentation**
 - 1. Used Documentation Degree (305) and Procedures for Preparing Project Documentation (299) as discussion base**
 - 2. Project currently at a DD level of about 5 to 6 or slightly higher**
 - 3. Should take steps 1, 2, 3, 4 and part of 5 now**
 - B. Reviewed case study #3 of Sierra/Hirtwell with those present**
 - 1. Showed how to assign document numbers**
 - 2. Discussed format for meeting notes**
 - 3. Began preparing abbreviation list**
 - 4. Selected document coding fields**
 - C. Worked on documentation sample of one month**

- I. *T. B. Simon Power Plant Unit 4 Addition notes*
- II. *By Ralph J. Stephenson*
- III. *Meeting date - Wednesday, November 6, 1991 (473)*
 - A. *Notes edited and added to 11/18/91 (481)*
- IV. *Location - MSU Power Plant field office*
- V. *Those attending*
 - A. *AM meetings - some in meeting part time*
 - 1. *Jim Simons - MSU project representative*
 - 2. *Dick Wever - MSU construction superintendent*
 - 3. *Phil Crockett - Design & Build - president*
 - 4. *Ralph J. Stephenson - consultant*
 - B. *PM meetings - some in meeting part time*
 - 1. *Dick Wever - MSU construction superintendent*
 - 2. *Jim Simons - MSU project representative*
 - 3. *John Wieland - Principal in charge - Alberici/Clark*
 - 4. *Jim Cornillie - Project director - A/C*
 - 5. *John Hucul - Project manager - A/C*
 - 6. *Dave Sadler - Project director - A/C*
 - 7. *Dave Monroe - Project superintendent - A/C*
 - 8. *Steve Hughes - Project manager - IMC Mechanical*
 - 9. *Ralph J. Stephenson - Consultant*
- VI. *Agenda (check means item discussed in meeting)*
 - A. *√Monitor foundation and site work plan of work*
 - B. *√Update foundation and site work plan of work to issue #7*
 - C. *√Review briefing manual contents*
 - D. *√Review and begin laying ground work for documentation system*
 - E. *√Review late issue of electrical construction package*
 - F. *√Identify impact of the late issue of the electrical construction package*
 - G. *√Discuss planning & scheduling with Alberici/Clark*
 - 1. *Networks issued to date*
 - 2. *Methodology of planning*
 - 3. *Methodology of scheduling*
 - 4. *Process of issuing plans & schedules*
 - 5. *Preparation of a construction site plan*
 - 6. *Set dates for planning & scheduling meetings*
 - a) *Steam generator - Tampella Keeler*
 - b) *Turbine generator - General Electrical*
 - c) *Cooling tower - Thermal Dynamic Towers, Inc*
 - d) *Fabric filter - Environmental Elements*
 - e) *Distributed controls - Bailey Controls Company*
 - f) *Structural steel - Almet, Inc.*
 - g) *Electrical construction - to be awarded on ?*
 - h) *Electrical equipment - to be awarded on ? - to be assigned to electrical construction*

Who administers this contract in the period between its award & award of the electrical construction contract

Friday, 11/08/91 (475) is deadline for award to meet equipment delivery dates
- VII. *Discussion notes*
 - A. *AM - monitoring and updating*
 - 1. *Reviewed current status of project with Jim Simons of MSU*
 - 2. *Reviewed current status of project with Phil Crockett of D&B*

3. Current status

- a) Site piping
30" and fire protection piping delivery to be held at 11/12/91 (477)
- b) Turbine foundation
Upper platform poured out - now curing
- c) Ash pit
Walls poured, stripped, waterproofed and backfilled
- d) PP#4 - perimeter foundation beams
Some have been poured, considerable work yet to be done
- e) Urea containment area
Containment area walls have been poured
- f) Current lag = ± 11 to 15 working days

4. Updated network model sheet #1 to issue #7, dated 11/06/91 (473)

- a) Completion date of latest task - sog at PP4 at 30" line is pm 12/24/91 (507)

B. PM - discussions with A/C general project manager

1. Specific agenda with A/C

- a) Networks issued to date
- b) Methodology of planning
- c) Methodology of scheduling
- d) Process of issuing plans & schedules
- e) Preparation of a construction site plan
- f) Set dates for planning & scheduling meetings with assigned contractors
 - Steam generator - Tampella Power
 - Turbine generator - General Electric
 - Cooling tower - Thermal Dynamic Towers, Inc
 - Fabric filter - Environmental Elements
 - Distributed controls - Bailey Controls Company
 - Structural steel - Almet, Inc.
 - Electrical construction - to be awarded on ?
 - Electrical equipment - to be awarded on ? - to be assigned to electrical construction
 - Who administers this contract in the period between its award & award of the electrical construction contract
 - Friday, 11/08/91 (475) is deadline for award to meet equipment delivery dates

- g) Briefing manual

2. Summary of meeting

- a) Briefing manual
 - Reviewed contracts awarded to date & contracts to be awarded
 - Discussed each point covered in the assignment portion
 - A/C generally agreed with the material - good discussion
- b) Planning and scheduling
 - A/C to use Primavera system with modem on site
 - A/C can convert MacProject networks to Primavera as required
 - A/C would like to use a milestone system (macro/micro)
 - Identify major project milestones and prepare summary network model
 - Prepare detailed network models and schedules within major milestone definitions
 - Provided John Hacul copies of selected network models for units #2 and 3
 - To be returned to rjs

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- c) Construction site planning
 - Discussed site layout for construction operations
 - IMC said will have 3 operations to locate to service site
 - A/C to review site requirements with all other contractors and prepare site layout
 - Reviewed storage of material and equipment
 - Discussed bondable storage
 - MSU said material must be on MSU property and properly stored to receive material payment under contract
- d) Contract administration and management
 - A/C requested copies of all contracts which are to be under their management
 - Briefly discussed control strength of A/C in relation to other prime contractors
 - Briefly reviewed insurance coverage and who carries
 - Discussed procedures for shop drawing reviews and approvals
 - Reviewed positions and duties of various MSU personnel on project
- e) Electrical construction contract package (73.0200)
 - To be presented for award approval to February, 1992 MSU Board of Trustees meeting

1:40:36 PM - Monday, October 21, 1991

- I. *T. B. Simon Power Plant Unit 4 Addition notes*
- II. *By Ralph J. Stephenson*
- III. *Meeting date - Monday, October 21, 1991*
- IV. *Location - MSU Physical Plant office & MSU Power Plant field office*
- V. *Those attending*
 - A. *AM meetings*
 1. *Robert Nestle - University engineer*
 2. *Robert Dowding - MSU contracts officer*
 3. *Joe Kavanagh - MSU project manager*
 4. *Jim Simons - MSU project representative*
 5. *Dick Wever - MSU construction superintendent*
 6. *Ralph J. Stephenson - consultant*
 - B. *PM meetings*
 1. *Dick Wever - MSU construction superintendent*
 2. *Jim Simons - MSU project representative*
 3. *Ralph J. Stephenson - consultant*
- VI. *Agenda*
 - A. *AM*
 1. *Discuss assignment of contracts*
 2. *Discuss interim date structure*
 3. *Review lay down area designations*
 4. *Decide on how to convey contract data to General Project Manager (gpm)*
 - B. *PM*
 1. *Prepare briefing manual for General Project Manager*
- VII. *MSU Power Plant #4 addition briefing manual*
 - A. *Table of contents - checks indicate item put in briefing manuals*
 1. *√Milestone dates*
 2. *√Design data and schedules*
 3. *√Covered in the 17 point discussion below under assignment of the various contracts indicated*
 - a) *√Planning and scheduling project work*
Design
Fabrication
Installation and erection
 - b) *√Contracts awarded to date*
 - c) *√Contracts to be awarded*
 - d) *√Management scope of work included in contracts*
 - e) *√Fabrication data and schedules*
 - f) *√Tracking project work*
Design
Fabrication
Installation & erection
 - g) *√Processing payments*
 - h) *√Processing submittals*
 - i) *√Processing revisions*
 4. *√Installation & erection data and schedules*
 - B. *Briefing Manual*
 1. *Contracts awarded to date*
 - a) *62.3401 - Steam generator - furnish & erect*
Awarded to Tampella Keeler - March 11, 1991 (wd 304)

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- b) 62.1001 - Turbine generator - furnish & erect
Awarded to General Electric - March 1, 1991 (wd 298)
- c) 62.0601 - Cooling tower - furnish & erect
Awarded to Thermal Dynamic Towers, Inc. - April 10, 1991 (wd 326)
- d) 62.0203 - Fabric filter
Awarded to Environmental Elements Corporation - March 19, 1991 (wd 310)
- e) 64.0212 - Distributed controls
Awarded to Bailey Controls Company - March 14, 1991 (wd 307)
- f) 71.0402 - Site work & concrete foundations
Approved for award to Design & Build of Lansing, Inc. - June 7, 1991 (wd 368)
- g) 61.4001 - Structural steel
Approved for award to Almet, Inc. - July 26, 1991 (wd 401)
- h) 72.0200 - General Project Management
Approved for award to joint venture of Alberici/Clark on October 11, 1991 (wd 456)
Includes
Architectural and building enclosure - formerly 71.0403
Mechanical construction - formerly 72.0200

2. *Contracts to be awarded*

- a) 73.0200 - Electrical construction - to be bid in January, 1992 & approved at the February, 1992 Board meeting
To be assigned to General Project Manager (72.2000)
- b) 63.0000 - Electrical equipment - bids received October 7, 1991 (wd 451)
Apparent low bidder - ?
Installation of electrical equipment to be assigned to electrical construction contractor (73.0200)

3. *Scope of General Project Manager's (gpm) work included in contracts*

From page 1A-4 & 5 - General Construction - 72.0200 - original specifications

Project Management Requirements.- The Contractor and his subcontractors shall actively participate in and adhere to the Owner's project management requirements, job rules and conduct, fire protection and safety procedures, and all other procedures initiated by the Owner for the purpose of maintaining jobsite administrative control. The Contractor and his subcontractors shall attend project management meetings or other meetings as deemed necessary by the Owner.

The Contractor shall have six other Owner contracts assigned as subcontracts for the purpose of project management, site coordination, and administration as specified herein.

The Contractor shall coordinate all subcontract work, monitor all activities, process all Bulletins, Change Orders, process all Applications for Payment, and interface all assigned subcontractors with the Owner. (sic).

For purposes of clarification, Project Management on this job shall include, but not necessarily be limited to the following minimum activities / responsibilities.

- a. Acceptance of assignment of the various contracts for this project as determined by the Owner.

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- b. Coordination & assignment of all laydown and storage space.
- c. Coordination & scheduling all project related site activities.
- d. Coordination, planning, & assisting the Owner's planning consultant with CPM scheduling of all project related construction activities.
- e. Arbitration & resolution between Contractor, Subcontractors and all assignees of all site & construction disputes.
- f. Timely and accurate processing of all bulletins, change orders, field orders, and payment requests for Contractor, Subcontractors, and all assignees.
- g. Attendance at and coordination of all weekly or special project progress meetings with the Owner.
- h. Monthly updates of all Owner CPM schedules using input from all parties.
- i. Coordination of all site services.
- j. Assist Owner's Project Representative in inspection of the Work to guard against defects and deficiencies.

As clarified in addendum #1 - page 8

- Accept assignment of the various contracts indicated.
- Monitor work of subcontractors and coordinate the work with activities and responsibilities of the Owner and the A & E.
- Coordinate, plan, and schedule all construction activities, and exercise control of the construction site.
- Assist Owner's CPM network planning consultant to develop and maintain project schedule.
- Assist Owner's Project Representative in inspection of the work to guard against defects and deficiencies.
- Arbitrate and resolve all site and construction disputes.
- Field inventory and inspection of all material received from suppliers and notify the Owner and subcontractors of any deficiencies.
- Implement timely and accurate program for processing shop drawings, bulletins, change orders, field orders, and payment requests.

4. Assignment of the various contracts indicated

The acceptance of assignment of design, furnish & install (dfi) contracts means that the General Project Manager will accept the Owner's instructions as to the gmp's scope of work for erection of the designed and furnished materials and equipment.

It is assumed by the Owner that all site fabrication is part of the installation and erection process, and as such is under the management of the General Project Manager, in conjunction with each dfi installation and erection supervisor.

The General Project Manager will be responsible for directing the dfi contractor's forces in the following activities from the time the dfi contractor moves on the project site or when dfi materials and equipment arrive on the project site, whichever is earlier.

- 01.) Plan all laydown and storage space.
- 02.) Make all space assignments to the dfi contractors
- 03.) Prepare an inventory of all dfi material and equipment as it arrives at the job site
- 04.) Insure that proper protection and insurance coverage is provided for all dfi materials and equipment by dfi contractor.
- 05.) Regularly inform Owner's representative of the current inventory location, amount, expected draw down from stock, protection status and insurance status of all dfi site stored materials & equipment.
- 06.) Participate in and mutually agree with the Owner, the dfi contractor, and the Owner's planning consultant on a clearly defined procedure for preparing and issuing network models and schedules for all dfi installation and erection activities.
- 07.) Plan and schedule all dfi project related installation and erection activities in conjunction with the dfi contractor and the Owner's planning consultant.
- 08.) Participate in and mutually agree with the Owner, the dfi contractor and the Owner's planning consultant on a clearly defined measuring and monitoring procedure for evaluating current project status on a regular basis.
- 09.) In conjunction with the Owner, the dfi contractor and the Owner's planning consultant, monitor project status and measure against the current network model and schedule on a regular basis.
- 10.) Participate in and mutually agree with the Owner, the dfi contractor and the Owner's planning consultant on a clearly defined network model and schedule updating procedures to be accomplished with all affected parties.
- 11.) Identify, arbitrate, and resolve installation and erection disputes between

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all dfi contractors, dfi subcontractors, and General Project Manager subcontractors.

12.) Act as the Owner's limited agent in effectively processing all erection and installation bulletins, change orders, field orders, and payment requests from dfi contractors. The procedures and limitations for processing are to be established in conjunction with the Owner's Representative to the mutual satisfaction of the General Project Manager and the Owner's Representative.

13.) Attend, conduct and prepare the official minutes of all weekly and special project progress meetings with the dfi contractors, the Owner, and the Architect and Engineer.

14.) Provide all services required to maintain the construction site so as to be fully accessible and usable by the Owner and all contractors. Details of this requirement are to be mutually agreed upon between the Owner and the General Project Manager.

15.) Develop a project construction quality control program to effectively protect the Owner from defects and deficiencies in the work. Such program shall be subject to the Owner's review and approval.

16.) Act as the Owner's limited agent in effectively processing all submittals including shop drawings, samples and mock ups among others. The procedures and limitations for processing are to be established in conjunction with the Owner's Representative to the mutual satisfaction of the General Project Manager and the Owner's Representative.

5. Milestone dates

- a) Provide the gpm with MSU power plant addition #4 contract dates data matrix
- b) Jim Simons to verify final matrix data with contract dates
- c) To be attached to briefing manual

6. Design data & schedules

- a) Included in Black & Veatch design and engineering schedules
- b) To be attached to briefing manual

7. List of network models & translations issued on project as of 10/21/91 (wd 461)

- a) Summary network models
 - Current networks
 - Sheet #sm2 - Issue #5, dated 09/05/91 (429)
 - b) Bulletin - change order processing network
 - Current networks
 - Sheet #cor 1 - Issue #3, dated 05/08/91 (346)
 - Superseded networks
 - Sheet #cor 1 - Issue #1, dated 04/23/91 (335)
 - Superseded by issue #2
 - Sheet #cor 1 - Issue #2, dated 05/06/91 (344)
 - Superseded by issue #3
 - c) Contract award networks
 - Template
 - Sheet #P1F - Issue #1, dated 03/12/91 (305)

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- Superseded by issue #2
- Sheet #P1F - Issue #2, dated 03/15/91 (308)
- Superseded by individual award networks
- Multiple contract award networks
- Current networks
 - Sheets #sscal 1, abcal 1, mcal1, elcal 1, eccal 1 - Issue # 2, dated May 22, 1991 (356)
 - Translations issued
 - Data tabulations
 - In es, ef sequence
 - By package in es, ef sequence
 - In ls, lf sequence
 - In lf, ls sequence
 - Bar chart by weekly increments
- d) Contract 71.0402 - Site & foundation work networks
 - Current networks
 - Sheet #1 - Issue #5, dated 09/3/91 (415)
 - Superseded networks
 - Sheet #Asm1 - Issue #1, dated 04/02/91 (320) - scenario A
 - Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #Bsm1 - Issue #1, dated 04/02/91 (320) - scenario B
 - Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #Csm1 - Issue #1, dated 04/02/91 (320) - scenario C
 - Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #1 - Issue #1, dated 05/23/91 (357)
 - Superseded by Issue #2
 - Sheet #1 - Issue #2, dated 06/07/92 (367)
 - Superseded by Issue #3
 - Sheet #1 - Issue #3, dated 07/12/91 (391)
 - Translations issued
 - Data tabulation in es, ef sequence
 - Bar chart by weekly increments
 - Superseded by Issue #4
 - Sheet #1 - Issue #4, dated 08/12/91 (412)
 - Translations issued
 - Day time scale bar chart
- e) Contract 61.4001 - Structural steel network
 - Current networks
 - Included in multiple contract award networks listed above
 - Superseded networks
 - Sheet #sscal - Issue #1 dated 04/23/91 (325)
 - Superseded by multiple network sheet ssal 1, abcal 1, mdal 1, elcal 1 & eccal
- f) Contract 62.3401 - Steam Generator network
 - Current networks
 - Sheet BL1 - issue #2 dated October 9, 1991 (wd 453)
 - Superseded network

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Sheet BL1 - issue #1 dated September 19, 1991 (wd 439)

8:56:40 AM - Wednesday, October 9, 1991

- I. T. B. Simon Power Plant Unit 4 Addition notes*
- II. By Ralph J. Stephenson*
- III. Meeting date - Wednesday, October 9, 1991*
- IV. Location - MSU Power Plant field office*
- V. Those attending - some in meeting part time only*
 - A. Jim Simons - MSU project representative*
 - B. Dick Weaver - MSU construction superintendent*
 - C. Ralph J. Stephenson - consultant*
- VI. Agenda*
 - A. Update steam generator summary network*
 - B. Prepare steel erection network model & integrate with TPC plan of work*
 - C. Continue preparing total project summary network*
 - D. Inspect & monitor project*
 - E. Update foundation and site network as required*
 - F. Prepare outline of work to be done with general project manager*
 - G. Review general approach to measurement of project against milestone dates*
 - H. Review documentation process and begin implementing documentation system*
 - I. Discuss distribution of monitoring reports*
- VII. General*
 - A. Organizational discussion of decision making*
 - 1. Board of Trustees
 - President
 - VP of administration
 - VP of business
 - VP physical plant
 - Director of maintenance
 - Director of construction
 - Director of design
 - Manager power plant operations
 - Other VP's

Thursday, September 19, 1991 (439)

I. Date of meeting - Thursday, September 19, 1991 (439)

A. Note: these observations were written on September 26, 1991 (444)

II. T. B. Simon Power Plant Unit 4 Addition notes

III. By Ralph J. Stephenson P. E.

IV. Location - MSU Power Plant conference room

V. Those attending - some in meeting part time only

- A. Robert Dowding (rdo) - MSU contracts & grants
- B. Joe Kavanagh (jka) - MSU project manager
- C. Bob Ellerhorst (rel) - MSU director of utilities
- D. Dick Wever - MSU construction superintendent
- E. Jim Simons - MSU project representative
- F. Doug MacDonald (dma) - MSU design coordinator
- G. Bruce Van Heest (bvhe) - Black & Veatch project engineer - civil & structural
- H. Gerald Hersh (ghe) - Tampella director of projects
- I. Dean Ely (del) - Tampella project manager
- J. Harry J. Markwick P. E. (hma) - Tampella project engineer
- K. James Kramer (jka) - Tampella project superintendent
- L. Ralph J. Stephenson - consultant

VI. Agenda

- A. Review current field work status of project
- B. Inspect project with Tampella Power staff
- C. Discuss assignment of contract conditions with Tampella Power
- D. Discuss interaction of other contractors with Tampell Power
- E. Prepare summary network model of steam generator erection
- F. Review B & V milestone dates
- G. Review lay down requirements for Tampella Power
- H. Review selection of general project manager, architectural and mechanical contractors

VII. Supplemental documents used in preparing summary network of total project

- A. Almet - Proposed bar chart for structural steel erection - 06/25/91 (338)
- B. B&V - Project summary bar chart - 07/01/91 (383)
- C. B&V - Project schedule printout - 07/29/91 (402)
- D. Tampella - Erection schedule for steam generator - 08/09/91 (411)
- E. Contract date lists abstracted from contracts by jsj & rjs - 08/15/91 (415)
- F. Tampella - MSU Erection master schedule - 09/17/91 (437)

VIII. General observations re steam generator erection

- A. In general Tampella desires erection time of the steam generator be about 10 months from start of steam drum to hydor test
 - 1. Start steam drum work - late March, 1992
 - 2. Complete hydo test - early January, 1993
- B. May not be able to totally meet this desired 10 month date framework
- C. Careful planning is needed to understand how each element fits the total plan best
- D. Considerable ground fabrication needed by Tampella. Might include:
 - 1. Cyclones
 - 2. Side wall panels
 - 3. Front wall panels
 - 4. Rear wall panels
 - 5. Sand bin
 - 6. Division walls
 - 7. Cyclone outlet manifold
 - 8. Air heater hoppers

Thursday, September 19, 1991 (439)

9. Secondary air duct
10. Primary air duct
11. Economizer inlet and outlet breeching
12. Superheater enclosure walls

IX. Network modeling

- A. Completed preparing network model sheet #BL1, issue #1, dated September 19, 1991 (439)
- B. Those receiving copies of sheet #BL1, issue #1
 1. MSU staff
 2. Black & Veatch
 3. Sent to Tampella by fax
- C. MSU, Tampella and Black & Veatch will review network for meeting of October 9, 1991 (453)
- D. Networks will be knit together to product master summary and detailed network models

Thursday - September 5, 1991 (429)

- I. T. B. Simon Power Plant Unit 4 Addition notes**
- II. By Ralph J. Stephenson**
- III. Meeting date Thursday, September 5, 1991 (429)**
 - A. Note that these observations were written on September 13, 1991 (435)**
- IV. Location - MSU Power Plant field office**
- V. Those attending - some in meeting part time only**
 - A. Dick Weaver - MSU construction superintendent**
 - B. Jim Simons - MSU project representative**
 - C. Ralph J. Stephenson - consultant**
- VI. Agenda**
 - A. Prepare summary network model of total project**
 - B. Review wording of proposal addenda to Architectural & Mechanical (a/m) contract 71.0200**
- VII. General notes**
 - A. Assignment of contracts**
 - 1. MSU considering assignment of erection only to a/m contractor (71.0200)
 - 2. Reviewed advantages and disadvantages of erection only with rwe & jsi
 - 3. Whatever course of action is followed it will require clarification in a pre bid addenda
 - 4. May require some method be used to revise the conditions of the dfi contracts already let
 - B. Interim dates**
 - 1. Agreed among those attending that the intermediate dates given should not be considered contract dates
 - 2. Language of documents to be reviewed
 - C. Summary network model**
 - 1. Prepared summary network model
 - 2. Incorporated dates and action items from various sources
 - 3. Matters to be resolved
 - How is the boiler steam drum erected through the roof?
 - Structural steel contractor to leave out designated steel members
 - These are identified on the structural contract documents
 - Must decide how return trips to the job by structural steel contractor are incorporated into contract requirements
 - How are discrepancies between contract milestone dates and TPC schedule to be resolved?
 - How is the cooling tower maintained from its completion to operation?
 - What grating is to be installed and what is to be left out for equipment setting?
 - Completion date discrepancies between structural steel schedule, contract documents & TPC schedule
 - 4. Completed summary network model sheet #sm1, issue #5 dated September 5, 1991 (429)
 - 5. Printed network and left copy with Jim Simons; he will distribute as needed

9:47:16 AM - Tuesday, September 3, 1991 (427)

- I. T. B. Simon Power Plant Unit 4 Addition notes**
- II. By Ralph J. Stephenson**
- III. Tuesday, September 3, 1991**
- IV. Location - MSU Power Plant field office**
- V. Those attending - some in meeting part time only**
 - A. Robert Nestle - MSU engineer**
 - B. Dick Wever - MSU construction superintendent**
 - C. Jim Simons - MSU project representative**
 - D. Phil Crockett - President - Design Build - foundation and site work**
 - E. Ralph J. Stephenson - consultant**
- VI. Agenda**
 - A. Inspect project**
 - B. Monitor project**
 - C. Review suggested revisions to general project manager specs**
 - D. Discuss those proposing on architectural/mechanical package**
 - E. Discuss project documentation degree & procedures**
- VII. Status of site & foundation work - package 71.0402**
 - A. Temporary wall erection**
 - 1. All existing wall removed
 - 2. Metal siding about 70% complete
 - B. Caissons**
 - 1. Complete from K to D & at fabric filter building
 - 2. About 9 more caissons to install
 - C. Turbine generator base**
 - 1. Not started
 - D. Urea containment area**
 - 1. Base slab poured
 - E. Services from PP #4 to cooling tower**
 - 1. Installing lines and constructing structures
 - F. Cooling tower foundation**
 - 1. Constructing isolated footings
 - 2. Constructing baffle roof deck

911:14 (7)
8:48:39 AM - Monday, August 12, 1991 (412)

- I. T. B. Simon Power Plant Unit 4 Addition notes**
- II. By Ralph J. Stephenson**
- III. Monday, August 12, 1991**
- IV. Location - MSU Power Plant field office**
- V. Those attending**
 - A. Early am meeting**
 - 1. Dick Wever - construction superintendent
 - 2. Jim Simons - MSU project representative
 - 3. Ralph J. Stephenson - consultant
 - B. Late am meeting**
 - 1. Ron Flinn (rfl) - assistant vice president & director of physical plant
 - 2. Robert Nestle (rne) - engineer
 - 3. Joe Kavanagh (jka) - project manager
 - 4. Dick Wever (rwe) - construction superintendent
 - 5. Jim Simons (jsi) - project representative
 - 6. Ralph J. Stephenson (rjs) - consultant
 - C. Early pm meeting**
 - 1. Dick Wever (rwe) - construction superintendent
 - 2. Jim Simons (jsi) - project representative
 - 3. Phil Crockett (pcr) - president - Design & Build
 - 4. Ralph J. Stephenson (rjs) - consultant
 - D. Late pm meeting**
 - 1. Joe Kavanagh (jka) - project manager
 - 2. Dick Wever (rwe) - construction superintendent
 - 3. Jim Simons (jsi) - project representative
 - 4. Ralph J. Stephenson (rjs) - consultant
- VI. Agenda - checked items completed at meeting**
 - A. Review documentation procedures**
 - B. Outline recommended documentation procedures for project**
 - C. Plan structural steel erection**
 - D. Continue prepare summary network model for entire project**
 - E. Discuss distribution of monitoring reports**
 - F. √Review potential conflict points**
 - G. √Discuss and decide on method of tracking progress on design, furnish & install contracts**
 - 1. 62.3401 - Steam generator - Tampella Power
 - 2. 62.1001 - Turbine generator - General Electric
 - 3. 62.0601 - Cooling tower - Thermal Dynamics
 - 4. 62.0203 - Fabric filter building - Environmental Elements Corporation
 - 5. 62.0212 - Distributed control work - Bailey Controls Company
 - H. √Monitor project and update network**
- VII. Tracking progress on design, furnish and install contracts**

A. Questions

1. Where does MSU construction get the planning and scheduling documents of the contractors?
 - 62.3401 - Steam generator - Tampella Power
 - 62.1001 - Turbine generator - General Electric
 - 62.0601 - Cooling tower - Thermal Dynamics
 - 62.0203 - Fabric filter building - Environmental Elements Corporation
 - 62.0212 - Distributed control work - Bailey Controls Company
2. At what point will the MSU construction group be involved directly with the contractors
 - 62.3401 - Steam generator - Tampella Power
 - 62.1001 - Turbine generator - General Electric
 - 62.0601 - Cooling tower - Thermal Dynamics
 - 62.0203 - Fabric filter building - Environmental Elements Corporation
 - 62.0212 - Distributed control work - Bailey Controls Company

B. Needs of the MSU project team in respect to these contractors

1. Authentic & accurate design plan and schedule activities & data
2. Authentic & accurate fabrication plan and schedule activities & data
3. Authentic & accurate delivery plan and schedule activities & data
4. Authentic & accurate installation plan and schedule activities & data
5. Method of tracking all phases of the contractors work

C. Needs of the MSU general project manager in respect to these contractors

This firm will be on the project as of October 11, 1991 (455). They should have all the needed contractor information to properly manage the project.

1. Authentic & accurate design plan and schedule activities & data
2. Authentic & accurate fabrication plan and schedule activities & data
3. Authentic & accurate delivery plan and schedule activities & data
4. Authentic & accurate installation plan and schedule activities & data
5. Method of tracking all phases of the contractors work
6. Managerial leverage to permit proper direction of the work
7. Complete document files on all assigned contractors
8. Complete list of contract requirements for the contractors

Scope

Contract dates

Key personnel

D. Possible answers & techniques

1. Work through Black & Veatch directly to obtain plan and schedule information
2. Work through jka directly to obtain plan and schedule information

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3. Continue on present course of action until gpm comes on job in October, 1991
Then have him gather all material he needs
4. Prepare summary or detailed plans of action now and turn over to gpm in October, 1991
Should not make the networks part of the contract documents
Can make key target dates part of the gpm's work.

12:53:55 PM - Friday, August 2, 1991 (406)

- I. T. B. Simon Power Plant Unit 4 Addition notes**
- II. By Ralph J. Stephenson**
- III. Friday, August 2, 1991 (406)**
- IV. Location - MSU Power Plant field office**
- V. Those attending**
 - A. Dick Wever - MSU construction superintendent - in meeting part time**
 - B. Jim Simons - MSU project representative**
 - C. Ralph J. Stephenson - consultant**
- VI. Agenda - checked items completed at meeting**
 - A. Monitor project and update network if appropriate**
 - 1. Might do on Thursday, August 8, 1991 (410)
 - B. Plan structural steel erection**
 - C. Discuss possible operating methods of general project manager**
 - D. Review intermediate date setting process**
 - E. Continue prepare summary network model for entire project**
 - F. √Review photo format and method of taking photos for record**
 - G. √Discuss potential conflict points on total project**
 - H. √Review results of mechanical & architectural package reviews**
 - I. √Make preliminary review of documentation processes**
 - J. √Review status of chemical & electrical foundation package**
- VII. Record photo taking**
 - A. MSU staff presently taking photos once per week**
 - 1. From same vantage points
 - B. MSU staff also taking photos of ongoing work as needed**
 - 1. From vantage points as available
 - C. Should have following minimum info on photos**
 - 1. Date
 - 2. Photo identifier
 - Roll number - to locate negatives - 00.
 - Photo number - to locate photo on negatives - .00
 - Example 03.10 - roll #3, photo #10
 - 3. Subject
 - 4. Location
 - Should make site & bldg key plan, have reduced and a rubber stanp made for back of photos
 - Compass direction
 - Building footprints
 - Overall site boundaries
 - Key column lines
 - Show from where photo was taken and in what direction
 - 5. Remarks
 - D. Ultimately should record photos in data base file**

VIII. Potential conflict points on project

A. Discussed these with Mr. Richard Wever and Mr. Jim Simons

B. Continuing discussions to be held with those below as desired & as they are available

1. Ron Flinn
2. Robert Dowding
3. Joe Kavanagh
4. Dick Wever
5. Jim Simons
6. & other interested parties

C. Material reviewed shown in discussion outline and in gray book handout material

1. Left one extra copy of discussion outline
2. Left 7 additional copies of gray book - reference material for background

IX. Current status of project

A. 71.0402 - Site & foundation work - not formally monitored

1. Demolition of existing west elevation in work
Some temporary wall up - about 20% complete
Masonry being removed - about 40% complete
Some metal siding up
2. Caissons being installed
Started at col line DD instead of at north to minimize interference with existing west walk demolition
9 of 64 total caissons installed
Caisson at col line DD14 mislocated to col line DD 13.9
Column carrying 304 kip
b&v thinking of adjusting structural steel to accomodate mislocated caisson
On 08/02/91 (406) hit chimney lighting cable in drilling caisson at col line DD
3. Parking areas being gravelled
4. Cooling tower basin in work
Baffle in work
5. Procurement
Shop drawings for site piping submitted and approved - in fabrication
No transformer shop drawings received from contractor as yet

B. 61.4001 - Structural steel

1. Contract approved on 07/26/91 (401)
2. Letter of intent issued to Almet on 07/26/91 (401)
3. Contracts being drawn currently

12:53:55 PM - Friday, August 2, 1991 (406)

4. Major time frames from proposed schedule by Almet, dated June 25, 1991 (379)
 - Detailing, submittals & approval - 08/01/91 (405) to 11/29/91 (490)
 - Fabrication - 10/01/91 (447) to 01/31/92 (533)
 - Erection - 12/26/91 (507) to 03/31/92 (575)

C. *Electrical & chemical building (ecb)*

1. Bulletin to be issued to Design & Build for electrical & chemical bldg foundation work
 - To be issued 08/16/91 (416) for pricing by Design & Build, site & foundation contractor
 - Price for ecb to be submitted by 08/30/91 (427)
 - Change order to be released by 09/13/91 (435)

D. *71.0403 - Architectural & building enclosure*

1. Owner review with B & V made on 07/26/91 (401)
2. To be issued for proposals on 08/09/91 (411)
3. Proposals due 09/24/91 (442)
4. Owner to take 5 wd to review & recommend by 10/01/91 (447)
5. Need 3 weeks or 15 wd to put on Board agenda
6. Want to be on 10/11/91 (455) Board agenda
7. **Will miss this by 7 working days or 1 2/5 weeks if current submission requirements are held**

E. *71.0200 - Mechanical construction*

1. Owner review with B & V made on 07/26/91 (401)
2. To be issued for proposals on 08/09/91 (411)
3. Proposals due 09/24/91 (442)
4. Owner to take 5 wd to review & recommend by 10/01/91 (447)
5. Need 3 weeks or 15 wd to put on Board agenda
6. Want to be on 10/11/91 (455) Board agenda
7. **Will miss this by 7 working days or 1 2/5 weeks if current submission requirements are held**

X. *Documentation process*

A. *Discussed level of documentation that might be appropriate at this time.*

B. *Used material on pages 29 to 35 and 36 to 40 in gray ho book as basis for review*

1. Consider project is currently at a level 5 & 6 requirement
2. Review at next meeting

Handwritten signature

Project conflict material for discussion - MSU PP #4 - July 31, 1991 (404)

I. Potential conflict points on project - arranged in descending order of conflict potential

The number directly preceding the item indicates the estimated degree to which it appears that the potential conflict point could become a real difficulty. A rating of 01 to 03 indicates a relatively low potential for problems. A rating from 04 to 06 indicates the matter is potentially serious enough to warrant special attention now with the matter being addressed at a middle management level within the owner and design groups. A rating from 07 to 10 indicates the potential for very serious problems that must be addressed now by the owner & designer group upper management

- (A) 09 - Preparation of inadequate or unsuitable documentation *designer pgs 29 thru 40 32 Step C*
- (B) 09 - Need for high level of excellence in checking contract documents *37 pp (6)*
- (C) 09 - Maladministration by the owner and the design team *(10) pp.*
- (D) 09 - Bringing the efforts of the large number of organizations involved to date under a unified management *3*
- (E) 08 - Poor definition of responsibility and authority among parties to the project *do bubble chart*
- (F) 08 - Penalties that may be assessed without adequate design, fabrication and installation control on impacting elements *(legislative design & dimension)*
- (G) 08 - Multiple sources of direction to multiple contractors - gives opportunities for divide & claim
- (H) 08 - Loose program and design control of major design, manufacture & install contractors →
- (I) 08 - Inadequately managed interfacing work during testing and run in & owner start up →
- (J) 07 - Schedule dysfunctions between contracts - inadequate interfacing
- (K) 07 - Inadequate meshing of management systems of many powerful primes put under a general project manager (gpm)
- (L) 07 - Inequitable or unfair retention practices ←
- M. 07 - Delays to supplier, contractor, designer and owner decision making on revisions, clarifications and other project matters
 - 1. Submittals
 - 2. Manufacture
 - 3. Fabrication
 - 4. Installation
 - 5. Construction
- N. 07 - Work scope gaps between contracts that are not covered adequately by contract documents
 - 1. Could use contract document matrix as example of how to help avoid this ←
- O. 06 - Requiring contractors to meet intermediate contract dates that are not significant, out of sequence, or improperly timed
- P. 06 - Need for gpm to be vested with adequate clout to provide effective leverage, fairly applied, as needed
- Q. 06 - Need for excellence in contract package release procedures
- R. 06 - Large number of pre selected contractors with inadequately defined accountability
 - This situation could be used by the pre selected contractor, or other contractors seeing a benefit to themselves, to fragment the efforts of the owner, the design team, other contractors and the project staff.
- S. 06 - Inadequately planned & poorly executed punching and closing out procedures
- T. 06 - Inadequately communicated definition of conform specs and their impact on related suppliers and contractors
- U. 06 - Inadequate project management across critical transition points
- V. 06 - Inadequate or inaccurate tracking of money flow against projected budgets *(2)(3) + Res.*
- W. 06 - Inadequate implementation of high quality construction administration practices from designer and owner
- X. 05 - Splintered owner control

Project conflict material for discussion - MSU PP #4 - July 31, 1991 (404)

- Y. 05 - Current litigious nature of the construction industry and heavy legal resources of larger contractors & vendors
- Z. 05 - Lack of understanding by owner and design team as to what causes claims (CF7) 8-12
- AA. 05 - Difficulties in determining & implementing fair and proper system of retention.
- AB. 04 - Slow payment practices
- AC. 04 - Processing of revisions to contracts
 See sheet #cor 1 issue 3 for current processing sequence as reviewed by project team on 05/08/91 (346)
1. Design contracts
 2. Design & furnish contracts
 3. Design, furnish & install contracts
 4. Service contracts
 5. Construction contracts
- AD. 04 - Poor submittal quality
- AE. 04 - Inadequate management at intersections of direct and dependent objectives (4)
- AF. 04 - Disputes over ownership of float time (18) (9)
- AG. 04 - Delays in submittal approvals and return
- AH. 03 - Not knowing how to ask critical management questions and get useful answers (5)
- AI. 03 - Inadequate or overly subjective monitoring and problem identification
1. Checks and balances system must be maintained and kept as flawless as possible
- AJ. 03 - Inadequate definition of the start, the end and the scope of warranty periods
- AK. 02 - inadequate information on equipment and materials to be reused or connected to new facility
- II. Things to do to help avoid damaging conflict on project - arranged alphabetically**
- A. Assign risk to those who are best able to assume it
 1. You can't make a silk purse out of a sow's ear
 - B. Avoid unfair or inappropriately assessed penalties
 - C. Begin building a project history
 - D. Centralize owner control
 - E. Clarify conform spec for all contractors
 - F. Clarify ownership of float time (internally)
 - G. Clearly define methods by which all project revisions are to be made
 - H. Constantly train and educate the msu project staff - particularly student employees
 1. Keep students busy on useful and meaningful project work
 - I. Establish clear cut authority and responsibility patterns
 - J. Expedite submittal approvals and keep current
 - K. Identify accountability patterns and define these clearly
 - L. Identify all equipment to be reused or salvaged & clearly state its disposition in the contract documents
 - M. Identify critical transition points on the project and provide high quality management across them
 - N. Identify specifically and explicitly the general project manager's duties, responsibilities, authority and liability.
 - O. Improve owner and designer knowledge of claim causes
 - P. Insist on mature and responsible managers for all contracts, particularly the gpm (general project manager)
 - Q. Insist on proper checking of design documents for proper interfacing between contracts
 - R. Insure that the entire project contractor team knows that the owner is documenting the project
 - S. Insure the design team has adequate funds to complete prepare documents, and to furnish proper construction administration

Project conflict material for discussion - MSU PP #4 - July 31, 1991 (404)

1. Constuction administration costs are normally about 25% (check current figures) of the total design fee
- T. Maintain high quality level in design/manufacture/install contract documents
- U. Maintain high quality level in designer checks of contract documents
- V. Must unify owner management of the project
- W. Owner must retain review and approval control of all major plan and schedule milestones
 1. Must be careful not to overdo this. Specifiying superflous, impossible or improbable milestones is expensive and poor practice
- X. Pay promptly
- Y. Plot actual cash flow against projected at least monthly
- Z. Prepare a contract document matrix (?) *bulletin request*
- AA. Process changes promptly
- AB. Retain the right of substantial owner review of all major management elements by the gpm
- AC. Set & implement fair and equitable payment and retention policies & practices
- AD. Set the starting point and expiration of warranty periods early
- AE. Set up and maintain a document control system of an appropriate degree 6
- AF. Simplify and minimize the number of change documents - need only bulletins change orders and field orders *emergency*
- AG. Start planning & implementing close out of the project at least 12 to 9 months (to be checked) before start up 25-28
- AH. Top owner managment should review, accept or change, and then back the project management system to be used on the job
- AI. Vest the gpm with adequate leverage to permit him to exert strong control over all prime contractors assigned to him
 1. For those primes not assigned, control methods & procedures must be set and implemented to prevent job anarchy

8:54:41 AM - Wednesday, July 31, 1991 (404)

- I. **T. B. Simon Power Plant Unit 4 Addition notes**
- II. **By Ralph J. Stephenson**
- III. **Wednesday, July 31, 1991 (404)**
- IV. **Office work on agenda items for MSU meetings on Friday, August 2, 1991 (406)**
 - A. **Might also meet at site on August 8, 1991 (155) for continuing discussions**
- V. **Agenda items to study**
 - A. **Discuss potential conflict points on total project**
 - B. **Plan structural steel erection**
 - C. **Continue prepare summary network model for entire project**
 - D. **Review photo format and method of taking photos for record**
 - E. **Review intermediate date setting process**
 - F. **Review results of mechanical & architectural package reviews**
 - G. **Discuss possible operating methods of general project manager**
 - H. **Monitor project and update network if appropriate**
 1. **Might do on Thursday, August 8, 1991 (410)**
- VI. **List of network models & translations issued on project as of 07/31/91 (404)**
 - A. **Bulletin - change order processing network**
 1. **Superseded networks**
 - Sheet #cor 1 - Issue #1, dated 04/23/91 (335)
Superseded by issue #2
 - Sheet #cor 1 - Issue #2, dated 05/06/91 (344)
Superseded by issue #3
 2. **Current networks**
 - Sheet #cor 1 - Issue #3, dated 05/08/91 (346)
 - B. **Contract 71.0402 - Site & foundation work**
 1. **Superseded networks**
 - Sheet #Asm1 - Issue #1, dated 04/02/91 (320) - scenario A
Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #Bsm1 - Issue #1, dated 04/02/91 (320) - scenario B
Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #Csm1 - Issue #1, dated 04/02/91 (320) - scenario C
Superseded by sheet #1, issue #1 & by multiple contract award networks
 - Sheet #1 - Issue #1, dated 05/23/91 (357)
Superseded by Issue #2
 - Sheet #1 - Issue #2, dated 06/07/92 (367)
Superseded by Issue #3
 2. **Current networks**
 - Sheet #1 - Issue #3, dated 07/12/91 (391)
Translations issued

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Data tabulation in es, ef sequence

Bar chart by weekly increments

C. Contract 61.4001 - Structural steel

1. Superseded networks

Sheet #sscal - Issue #1 dated 04/23/91 (325)

Superseded by multiple network sheet sscal 1, abcal 1, mdal 1, elcal 1 & eccal

2. Current networks

Included in multiple contract award networks listed above

D. Contract award networks

1. Template

Sheet #P1F - Issue #1, dated 03/12/91 (305)

Superseded by issue #2

Sheet #P1F - Issue #2, dated 03/15/91 (308)

Superseded by individual award networks

2. Multiple contract award networks

Current networks

Sheets #sscal 1, abcal 1, mcal1, elcal 1, eccal 1 - Issue # 2, dated May 22, 1991 (356)

Translations issued

Data tabulations

In es, ef sequence

By package in es, ef sequence

In ls, lf sequence

In lf, ls sequence

Bar chart by weekly increments

VII. Project conflict material for discussion - MSU PP #4 - July 31, 1991 (404)

A. Potential conflict points on project - arranged in descending order of conflict potential

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 - Manufacture
 - Fabrication
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 - Construction
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21. 06 - Inadequate project management across critical transition points
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See sheet #cor 1 issue 3 for current processing sequence as reviewed by project team on 05/08/91 (346)
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You can't make a silk purse out of a sow's ear
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8. Constantly train and educate the msu project staff - particularly student employees

Keep students busy on useful and meaningful project work

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 31. Set up and maintain a document control system of an appropriate degree
 32. Simplify and minimize the number of change documents - need only bulletins, change orders and field orders
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- For those primes not assigned, control methods & procedures must be set and implemented to prevent job anarchy

VIII. Project folder titles

- A. 01 - B & V plan & schedule data*
- B. 02 - Contract date info*
- C. 03 - Current monitoring networks & translations*
- D. 04 - Decision table material - selection of project management system*
- E. 05 - Laundry lists*
- F. 06 - Letters*
- G. 07 - Meeting notes*
- H. 08 - Miscellaneous materials*
- I. 09 - Monitoring reports*
- J. 10 - Spec sections*
- K. 11 - Submittal material*
- L. 12 - Superseded materials*

IX. Discussion material book for August 2, 1991 (406)

- A. Handout material to issue on Friday, August 2, 1991 (406) - by ho number*
 1. 081 - Line of action
 2. 125 - Claim prone job characteristics
 3. 136 - Chicago area weather
 4. 147 - Project money flow
 5. 186 - Questions to ask
 6. 197 - The dio/pdo intersection
 7. 198 - Bulletin/change order record
 8. 200 - Equipment activity tabulation
 9. 228 - Common causes of contested claims
 10. 259 - Retentions, collections & final payments
 11. 280 - Use of float time
 12. 299 - Procedures for preparing project documentation

13. 300 - Procurement network model
 14. 305 - Documentation degree
 15. 323 - Closing out a construction project
 16. 341 - 37 elements of importance to success in design & construction
 17. 350 - Costs committed vs money spent
 18. 361 - Construction contract characteristics
 19. 375 - Record types and their uses
- B. Handout material to issue on Friday, August 2, 1991 (406) - in order of assembly**
1. 081 - Line of action
 2. 350 - Costs committed vs money spent
 3. 147 - Project money flow
 4. 197 - The dio/pdo intersection
 5. 186 - Questions to ask
 6. 125 - Claim prone job characteristics
 7. 228 - Common causes of contested claims
 8. 341 - 37 elements of importance to success in design & construction
 9. 361 - Construction contract characteristics
 10. 136 - Chicago area weather
 11. 280 - Use of float time
 12. 375 - Record types and their uses
 13. 200 - Equipment activity tabulation
 14. 300 - Procurement network model
 15. 198 - Bulletin/change order record
 16. 323 - Closing out a construction project
 17. 299 - Procedures for preparing project documentation
 18. 305 - Documentation degree
 19. 259 - Retentions, collections & final payments
- C. Project discussion material index**
1. 01 Line of action - 081
 2. 02 Costs committed vs money spent - 350
 3. 03 Project money flow - 147
 4. 04 The dio/pdo intersection - 197
 5. 05 Questions to ask -186
 6. 06 & 07 Claim prone job characteristics - 125
 7. 08 to 12 Common causes of contested claims - 228
 8. 13 to 15 Elements of importance to success in design & construction - 341
 9. 16 Construction contract characteristics - 371
 10. 17 Chicago area weather - 136
 11. 18 & 19 Use of float time - 280
 12. 20 & 21 Record types and their uses - 375

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- 13. 22 Equipment activity tabulation - 200
- 14. 23 Procurement network model - 300
- 15. 24 Bulletin/change order record - 198
- 16. 25 to 28 Closing out a construction project - 323
- 17. 29 to 35 Procedures for preparing project documentation - 299
- 18. 36 to 40 Documentation degree - 305
- 19. 41 to 48 Retentions, collections & final payments - 259

6

9:13:59 AM - Friday, June 7, 1991 (367)

1. *Friday, June 7, 1991*
2. *T. B. Simon Power Plant Unit 4 Addition*
3. *Location - MSU Power Plant field office*
4. *Those attending*
 - 4.1. *Dick Wever - MSU construction superintendent - in meeting part time*
 - 4.2. *Jim Simons - MSU project representative*
 - 4.3. *David Erickson - MSU student employee*
 - 4.4. *Phil Dimitri - Project manager - B & V (in meeting briefly)*
 - 4.5. *Phil Crockett - Design & Build - President*
 - 4.6. *Ralph J. Stephenson - consultant*
5. *Agenda*
 - 5.1. *Monitor current project status*
 - 5.1.1. *Current projects not yet let*
 - 71.0402 - Site & foundation work
 - 61.4001 - Structural steel
 - 71.0403 - Architectural & building enclosure
 - 72.0200 - Mechanical construction
 - 73.0200 - Electrical construction
 - 63.0000 - Electrical equipment
 - ? - Electrical configuration
 - 5.1.2. *Design, furnish & install contracts*
 - 62.3401 - Steam generator
 - 62.1001 - Turbine generator
 - 62.0601 - Cooling tower
 - 62.0203 - Fabric filter
 - 64.0212 - Distributed control package
 - 5.2. *Get current status of each component from B & V or from Doug MacDonald at Power Plant*
 - 5.3. *Review format of Expedition tracking program*
 - 5.4. *Do some bar chart tracking of submittals*
 - 5.5. *Complete prepare site and foundation network model with owner & contractor*
 - 5.5.1. *Show details for construction of temporary wall*
 - 5.5.2. *Show as much procurement as possible*
 - 5.6. *Review tracking techniques against conform spec dates*
 - 5.7. *Tour existing power plant*
 - 5.8. *Continue preparing glossary of terms*
 - 5.8.1. *Redefine certified drawings*
 - 5.8.2. *Only B & V apparently know their needs*
6. *Current project status*
 - 6.1. *Design, furnish & install projects that have been awarded*
 - 6.1.1. *62.0203 - Fabric filter - Environmental Elements Corporation*

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No current status information available
From B & V schedule data sheet dated 06/03/91 (363)
Exchange engineering info
To begin am 02/04/91 (279)
To be completed pm 08/27/91 (494)
Manufacture & deliver fabric filter
To begin am 10/31/91 (469)
To be completed pm 06/01/92 (618)
Contractor mobilize
To begin am 05/18/92 (608)
To be completed pm 05/29/92 (617)
Erect fabric filter
To begin am 06/02/92 (618)
To be completed pm 04/30/93 (852)

6.1.2. 62.0601 - Cooling tower - Thermal Dynamics

No current status information available
From B & V schedule data sheet dated 06/03/91 (363)
Exchange engineering info
To begin am 02/01/91 (278)
To be completed pm 01/02/92 (512)
Manufacture & deliver cooling tower
To begin am 01/03/92 (512)
To be completed pm 04/30/92 (574)
Contractor mobilize
To begin am 05/01/92 (597)
To be completed pm 05/07/92 (602)
Erect cooling tower
To begin am 05/08/92 (602)
To be completed pm 09/10/92 (689)

6.1.3. 62.1001 - Turbine generator - General Electric

No current status information available
From B & V schedule data sheet dated 06/03/91 (363)
Exchange engineering info
To begin am 11/30/90 (235)
To be completed pm 10/23/91 (464)
Manufacture & deliver steam turbine generator
To begin am 01/25/91 (273)
To be completed pm 06/04/92 (621)
Contractor mobilize
To begin am 05/22/92 (612)
To be completed pm 06/04/92 (621)
Erect steam turbine generator

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To begin am 06/05/92 (621)

To be completed pm 12/07/92 (749)

6.1.4. 62.3401 - Steam generator - Tampella Power Corporation

Have set document control procedure in letter of 05/14/91 (350)

All drawings & correspondence are to be sent to

Tampella Power Corporation

P. O. Box 3308

2600 Reach Road

Williamsport, PA 17701

Attn: Document Control Administrator

Schedule submitted by TPC with letter of 05/14/91 (350) from Dean Ely

Date of schedule - 05/13/91 (349)

Content of schedule & required status as of 06/07/91 (367)

Engineering

Total engineering - should be about 25% complete

To be completed pm 08/07/92 (666)

Engineering to support A/E - should be about 60% complete

To be completed pm 10/16/91 (459)

Engineering to support shipments - should be about 17% complete

To be completed pm 08/07/92 (666)

Manufacturing

Total manufacturing

To begin on am 12/17/91 (501)

To be completed pm 10/21/92 (718)

Drum -1 - manufacturing

To begin on am 12/17/91 (501)

To be completed pm 04/27/92 (594)

Headers -1 - manufacturing

To begin on am 02/13/92 (541)

To be completed pm 10/21/92 (718)

Membrane wall & tubes -1 - manufacturing

To begin on am 12/31/91 (510)

To be completed pm 09/02/92 (684)

Miscellaneous steel -1 - manufacturing

To begin on am 12/17/91 (501)

To be completed pm 09/28/92 (701)

Purchase items - 1

To begin on am 06/17/91 (373)

To be completed pm 01/22/93 (782)

9:13:59 AM - Friday, June 7, 1991 (367)

Erection

To begin on am 02/25/92 (549)

To be completed pm 06/07/93 (877)

Start up

Total start up

To begin on am 05/03/93 (852)

To be completed pm 09/07/93 (941)

First firing - steam generator

To begin on am 05/03/93 (852)

To be completed pm 05/03/93 (853)

Steam line blow out

To begin on am 06/01/93 (872)

To be completed pm 06/01/93 (873)

Initial operation

To begin on am 08/02/93 (915)

To be completed pm 08/02/93 (916)

Commercial operation

To begin on am 09/07/93 (940)

To be completed pm 09/07/93 (941)

6.1.5. 64.0212 - Distributed control package - Bailey Control Company

Schedule submitted by B & V in meeting minutes of Bailey kick off session on 05/13/91 (349)

Date of schedule - 05/01/91 (341)

Content of schedule & required status as of 06/07/91 (367)

Phase 1

Bailey /ETSI graphic spec - should be about 98% complete

To be completed on pm 06/10/91 (369)

Submit P&ID's to Bailey - should be 100% complete

To be completed pm 05/27/91 (359)

Bailey review prelim P&ID's - should be 100% complete

To be completed pm 06/03/91 (364)

Develop prelim architecture - should be about 90% complete

To be completed pm 06/10/91 (369)

Review architectural & graphics

To begin on am 06/12/91 (370)

To be completed pm 06/21/91 (378)

Estimate remaining I/O

To begin on am 06/21/91 (377)

To be completed pm 07/02/91 (385)

Final architecture

To begin on am 06/21/91 (377)

9:13:59 AM - Friday, June 7, 1991 (367)

To be completed pm 07/02/91 (385)

Vendor meetings

To begin on am 06/21/91 (377)

To be completed pm 07/02/91 (385)

Bailey cabinet arrangement

To begin on am 07/29/91 (402)

To be completed pm 09/30/91 (447)

Bailey externals

To begin on am 07/29/91 (402)

To be completed pm 09/30/91 (447)

Determine missing systems

To begin on am 08/05/91 (407)

To be completed pm 09/03/91 (428)

Review

To begin on am 10/01/91 (447)

To be completed pm 10/18/91 (461)

Finalize cabinet arrangement

To begin on am 10/18/91 (460)

To be completed pm 11/04/91 (472)

Phase 2

Hardware cutoff

To begin on am 11/04/91 (471)

To be completed pm 11/04/91 (472)

Bailey configurations

To begin on am 11/04/91 (471)

To be completed pm 02/28/92 (553)

Adjust estimate: issue subsystem SO's

To begin on am 12/23/91 (505)

To be completed pm 01/20/92 (524)

6.2. Projects awarded and in work

6.2.1. 71.0402 - Site & foundation work

Contract award approved by MSU Board on June 7, 1991 (367)

Contractor to move on job site on June 10, 1991 (368)

6.3. Projects not yet awarded

6.3.1. 61.4001 - Structural steel

Being estimated by contractors

Contract award to be approved at July 26, 1991 Board meeting

6.3.2. 72.0200 - Will now be the architectural, building enclosure & mechanical package

71.0403 - Architectural & building enclosure

Will probably be combined with mechanical construction - 72.0200

Due to be issued for bidding between July 19, 1991 & July 26, 1991

9:13:59 AM - Friday, June 7, 1991 (367)

Contract award to be approved at October 11, 1991 Board meeting
72.0200 - Mechanical construction

Will probably be combined with architectural & building
enclosure

Due to be issued for bidding between July 19, 1991 & July 26, 1991

Contract award to be approved at October 11, 1991 Board meeting

6.3.3. 73.0200 - *Electrical construction*

To be issue for bidding on December 2, 1991 (490) - from Phil Dimitry
of B & V

Contract award to be approved at February 7, 1992 (537) Board meeting

6.3.4. 63.3600 - *Electrical equipment*

To be issued for bidding on pm August 9, 1991 (412) - from Phil
Dimitry of B & V

Contract award to be approved at October 11, 1991 (455) Board meeting

6.3.5. ? - *Electrical configuration*

10:56:31 AM - Thursday, May 23, 1991 (357)

1. *Thursday, May 23, 1991*
2. *T. B. Simon Power Plant Unit 4 Addition*
3. *Location - MSU Power Plant field office*
4. *Those attending*
 - 4.1. *Dick Wever - MSU construction superintendent - in meeting part time*
 - 4.2. *Jim Simons - MSU project representative*
 - 4.3. *Peter Skornia - MSU student employee*
 - 4.4. *Phil Crockett - president - in meeting part time*
 - 4.5. *Ralph J. Stephenson - consultant*
5. *Agenda*
 - 5.1. *Review possible formats for showing critical dates in conform specs*

The conform spec is a specification rewritten during pre contract negotiations with design and install contractors. These include the steam generator, turbine generator, cooling tower, fabric filter and distributed control system contracts.

In the conform spec many intermediate dates are given which are now apparently a part of the contracts between MSU and each design and furnish contractor.
 - 5.2. *Define unique terms being used by parties to the project*
 - 5.3. *√Review contract award networks, data files and bar charts*
 - 5.4. *√Review method of deriving data files and bar charts from network models*
 - 5.5. *√Complete prepare site & foundation construction laundry list*
6. *Spec submittal requirements for site work and foundation (package 71.0402)*
 - 6.1. *June, 1991 - Safety, health and accident program - single submittal*
 - 6.2. *June, 1991 - Injury & man hours lost report - full contract length*
 - 6.3. *June, 1991 - Fire protection and prevention plan - single submittal*
 - 6.4. *July, 1991 - Engineering schedule - single submittal*
 - 6.5. *July, 1991 - Procurement and shipment schedule - single submittal*
 - 6.6. *June, 1991 - On site quality control program - single submittal*
 - 6.7. *July, 1991 - Inspection and test outlines - single submittal*
 - 6.8. *June, 1991 - Construction schedule - single submittal*
 - 6.9. *June, 1991 - Proposed temporary facilities - single submittal*
 - 6.10. *June, 1991 - Proposed laydown and storage plan - single submittal*

2:05:51 PM - Thursday, May 16, 1991 (352)

1. *Thursday, May 16, 1991*
2. *T. B. Simon Power Plant Unit 4 Addition*
3. *Location - MSU Power Plant field office*
4. *Those attending*
 - 4.1. *Jim Simons - project representative*
 - 4.2. *Ralph J. Stephenson - consultant*
5. *Special & general requirements file*

It would be well to consider copying the special and general requirements into a word processor that can be run on the field computer. This would allow quick access to boiler plate requirements such as:

- Contract dates
- Administrative processes
- Submittal processes and requirements
- Bulletin to change order procedures
- Field order procedures
- Addendum information
- Document lists
- Key dates
- Minority requirements
- Bidding procedures
- Substitution requirements
- Subcontractor requirements
- Payment request processing
- Bonding
- Proposal cost information
- Unit costs
- Supplementary conditions
- Etc.

The specifications may already be written in a compatible word processor program so Black & Veatch could merely give you a disk copy. If not, then the specification could be copied over a period of time by the student and intern employees on the project. This would give them a good learning insight of what the specification consists of while providing a useful tool to the field management forces.

6. *Search for unit 2 network models*

The unit 2 project built in 1973 had a full network model prepared for its construction sequencing. rjs has been able to locate some of the network models but feels the remainder would also be of help in identifying typical sequences for mechanical and electrical work. Jim Simons has asked Doug MacDonald at the power plant to check the archives and locate the

networks if they exist. He is now doing this.

7. Current status of project

7.1. Foundations & site work - package 71.0402

7.1.1. Design & Build is the apparent low bidder

7.1.2. Temporary wall

Not designed as yet

Will probably be steel studs, plywood sheathing & visqueen on inside

Design & Build will submit design immediately after award of contract

7.1.3. Foundations

Using drilled piers (caissons)

Will drive with vibratory hammer

Earth to be augered out

Bearing area to be belled

Reinforcement will hang on a free line

Shell to be pulled as caisson is being filled

No load testing needed

Ash pit caissons will be filled to cut off elevation

Ash pit caissons then filled with soil to existing grade

7.1.4. Contractor to be considered at June 7, 1991 (wd 367) MSU board meeting

8. Agenda

8.1. Update general notes

8.2. Review current status of foundation design

8.3. Prepare full set of contract award network models

8.4. Revise summary network model for site & foundation contract work

8.5. Review current status of B & V contract documents

8.6. Continue preparing list of long lead items

8.7. √Try to find network models for unit 2 in Power Plant office files

8.8. √Consider electronic storage of special & general requirements

8:23:02 AM - Tuesday, April 23, 1991 (335)

1. *Tuesday, April 23, 1991*
2. *T. B. Simon Power Plant Unit 4 Addition*
3. *Location - MSU Physical Plant - East Lansing, Michigan*
4. *Those attending*
 - 4.1. *Bob Dowding - acting director contracts & grants - in meeting part time*
 - 4.2. *Joe Kavanagh - project manager*
 - 4.3. *Bob Ellerhorst - director of utilites - in meeting part time*
 - 4.4. *Dick Wever - construction superintendent*
 - 4.5. *Jim Simons - project representative*
 - 4.6. *Doug MacDonald - design coordinator*
 - 4.7. *Ralph J. Stephenson - consultant*
5. *Agenda*
 - 5.1. *Diagram contract award process for structural steel package 61.4001*
 - 5.2. *Prepare summary diagram of the packages*
 - 5.2.1. *Issue process*
 - 5.2.2. *Bidding process*
 - 5.2.3. *Award process*
 - 5.2.4. *Mobilization & move on site process*
 - 5.2.5. *Further if possible*
 - 5.3. *Continue prepare major item laundry lists*
 - 5.4. *√Identify long lead items for entire project*
 - 5.5. *√Review methods of tracking bulletins & change orders*
 - 5.6. *√List board meeting dates - need 1992 dates*
 - 5.7. *√Discuss the advisability of having the mechanical contractor as a prime*
 - 5.8. *√Diagram the change processes to be used*
 - 5.9. *√Monitor current status of project*
 - 5.10. *√Review package definitions as currently set*
 - 5.11. *?Tabulate intermediate contract dates specified - in progress*
 - 5.11.1. *MSU staff will complete*
 - 5.12. *?Review need to specify intermediate dates - to be done when list is complete*
6. *Distribution of monitoring reports*
 - 6.1. *Joe Kavanagh*
 - 6.2. *Dick Wever*
 - 6.3. *Jim Simon*
7. *Long lead items - to be continued*
 - 7.1. *Structural steel*
 - 7.2. *Turbine generator*
 - 7.3. *Fabric filter*
 - 7.4. *Cooling tower*
 - 7.5. *Motor control centers*
 - 7.6. *Switchgear*

- 7.7. *Transformers*
- 7.8. *Bus duct*
- 7.9. *Boiler feed pumps*
- 7.10. *Attenuator water pumps*
- 7.11. *High pressure valves*
- 7.12. *Slate*
- 7.13. *Brick*
- 7.14. *Limestone*
- 7.15. *DCS equipment*
 - 7.15.1. *Control panels*
- 7.16. *Primary air fans*
- 7.17. *Secondary air fans*
- 7.18. *Induced draft fans*
- 7.19. *Ash silo*
- 7.20. *Sand silo*
- 7.21. *Feed systems*
- 7.22. *Demineralizer*
- 7.23. *Closed system cooling system*
- 7.24. *Conveying equipment*
- 8. *General notes*
 - 8.1. *Where is the right of assignment specification?*
 - 8.1.1. *Need for assignment of structural steel to prime contractor?*
 - 8.2. *Intermediate milestone dates included issued contract packages*
 - To be abstracted by project team & given to rjs for entering in master notes.
 - 8.2.1. *62.3401 - Steam generator - furnish & erect*
 - 03/30/92 (574) - Complete steam drum lift
 - 8.2.2. *62.1001 - Turbine generator - furnish & erect*
 - 8.2.3. *62.0601 - Cooling tower - furnish & erect*
 - 08/15/92 (671) - Complete setting cooling tower on foundations
 - 08/21/92 (676) - Complete fan alignments
 - 08/28/92 (681) - Complete operational & functional verifications
 - 03/01/93 (808) - Ready for initial operation
 - 09/07/93 (941) - Ready for commercial operation
 - 8.2.4. *62.0203 - Fabric filter*
 - 8.2.5. *71.0402 - Site work & concrete foundations*
 - 06/07/91 (367) - Approve award contract - letter of intent
 - 06/20/91 (376) - Mobilize & move on site
 - 11/15/91 (481) - Site grading complete
 - 12/31/91 (511) - Power plant & associated foundations complete
 - 12/31/91 (511) - Turbine foundations complete
 - 04/03/92 (578) - Cooling tower foundations complete

8:23:02 AM - Tuesday, April 23, 1991 (335)

- 8.2.6. 61.4001 - *Structural steel*
 - 07/26/91 (401) - Contract award
 - 03/01/92 (553) - Start erection of structural steel
 - 05/01/92 (598)- Complete erection of boiler room structural steel
 - To support boiler erection
 - 07/01/92 (640) - Complete all steel & deck erection & detailing
- 8.2.7. 71.0403 - *Architectural and building enclosure*
- 8.2.8. 72.0200 - *Mechanical construction*
- 8.2.9. 73.0200 - *Electrical construction*
- 8.3. *Give staff disk copy of files - send or bring to Jim Simons*
- 8.4. *Put disk numbers on monitoring reports*
- 8.5. *Tampella Keeler now known as TPC Tampella Power Corporation*
- 8.6. *Be certain to inform structural steel contractor of anchor bolt sizes & locations*
- 8.7. *64.0212 DCS package number*
- 8.8. *Board meeting dates*
 - 8.8.1. *February 1, 1991*
 - 8.8.2. *April 5, 1991*
 - 8.8.3. *July 26, 1991*
 - 8.8.4. *October 11, 1991*
 - 8.8.5. *December 6, 1991*
- 8.9. *Why the mechanical contractor as prime contractor?*
 - 8.9.1. *Was done only for the convenience of the construction contract*
 - 8.9.2.
- 9. *Current status of project - as of April 23, 1991 (335)*
 - 9.1. *Package 71.0402 - Site & foundation package - monitored from sheet Asm1 - issue #1 - April 2, 1991 (319)*
 - 9.1.1. *Activities #2, 3, 4, 5 - obtain data from suppliers*
 - No changes that affect the foundation package (71.0402)
 - Loads given by steam generator are good within ± 2 k
 - 9.1.2. *Activity #6 - issue bid addendum*
 - Addenda #1 issued April 12, 1991 (329)
 - Addenda #2 issued April 19, 1991 (334)
 - 9.1.3. *Activity #7 - part prepare proposals*
 - Complete
 - 9.1.4. *Bids due pm May 6, 1991 (345)*
 - 9.1.5. *Are planning to be on agenda of June 7, 1991 (367) board meeting*
 - 9.1.6. *Hold current date of June 20, 1991 (376) to move on site*
 - 9.1.7. *Project currently meeting dates between early & late starts & finishes*
 - 9.2. *Package 61.4001 - Structural steel*
 - 9.2.1. *Package currently about 90 to 95% complete*
 - 9.2.2. *Currently in for preliminary owner review*

8:23:02 AM - Tuesday, April 23, 1991 (335)

- 9.2.3. *04/30/91 - Final review of steam generator platform arrangement between B&V and TPC*
 - Will release final design for final owner review
- 9.2.4. *Planning to present recommendations at July 26, 1991 (401) board meeting*
- 9.2.5. *Must have recommendations to board by July 5, 1991 (386)*
- 9.2.6. *Bid due date currently pm June 14, 1991 (373)*
- 9.2.7. *Pre bid walk through on May 21, 1991 (355)*
- 9.2.8. *Package should be issued about 10 wd ahead of walk through - May 7, 1991 (345)*
- 9.2.9. *Scope of package*
 - Structural steel
 - Miscellaneous iron
 - stairs
 - platforms
 - Roof deck
 - Floor deck
- 9.3. *Package 64.0212 - Distributed control system (DCS) - furnish only with start up service*
 - 9.3.1. *Will have kick off meeting May 7 and 8, 1991 (345 & 346)*
 - 9.3.2. *Purpose of kick off meeting is to discuss design*
- 9.4. *Package 71.0403 - Architectural and building enclosure*
 - 9.4.1. *No date set for issue as of 04/23/91 (335)*
 - 9.4.2. *May be presented at October, 1991 Board meeting*
- 9.5. *Package 72.0200 - Mechanical construction*
 - 9.5.1. *No date set for issue as of 04/23/91 (335)*
 - 9.5.2. *May be presented at October, 1991 Board meeting*
 - 9.5.3. *Still intent of MSU to have this contractor be the prime contractor*
- 9.6. *Package 73.0200 - Electrical construction*
 - 9.6.1. *No official date set for issue as of 04/23/91 (335)*
 - 9.6.2. *Probably will present earlier than originally planned*
 - 9.6.3. *Will follow mechical contract approval*
- 9.7. *Package 63.0000 - Electrical equipment*
 - 9.7.1. *No official date set for issue as of 04/23/91 (335)*
 - 9.7.2. *Probably will go to board for approval*
 - 9.7.3. *Includes - partial list*
 - Switch gear - 63.3600
 - Transformers - 63.3800
 - Low voltage sub stations - 63.?
 - Lighting sub stations?
 - 9.7.4. *Will have scheduled turbine outage in late winter/early spring 1992 & spring 1993*

8:23:02 AM - Tuesday, April 23, 1991 (335)

Start before February & finish before April

Takes about 8 weeks

Would like to have

9.8. *Electrical reconfiguration package*

9.8.1. *No decision yet on content of package*

9.8.2. *Will be related to how package 63.0000 is awarded*

10. *Change tracking - Bob Dowding*

What is the methodology by which revisions are to be tracked & processed?

10.1. *How revisions are made*

10.1.1. *Design changes - made to design during design process*

Changes by suppliers & contractors who are designing their installation

10.1.2. *Construction changes - made to contract documents during construction*

10.2. *Design bulletin -*

10.3. *Construction bulletin - A request for a firm price for a proposed change*

10.3.1. *Issued jointly by the owner & the a/e*

10.4. *Bulletin request - An MSU internal document initiated by the a/e*

10.4.1. *Identifies:*

Who requested change

Brief description of change

a/e estimate of construction cost

10.4.2. *Sent to:*

First to MSU physical plant department - Bob Nestle

Then to contract administration - Bob Dowding

10.5. *Each contract package will have one prime contractor*

10.6. *These will be assigned to the mechanical*

10.7. *How done on Breslin*

10.7.1. *27 prime contracts*

10.7.2. *Bulletins*

10.8. *Needs of the system*

10.8.1. *To track of all bulletins by contract package*

10.8.2. *Method of having all primes sign off on bulletins*

10.8.3. *Protect MSU from delayed cost claims*

10.8.4.

9:58:43 AM - Tuesday, April 2, 1991 (320)

1. *Tuesday, April 2, 1991*
2. *T. B. Simon Power Plant Unit 4 Addition*
3. *Location - MSU Physical Plant - East Lansing, Michigan*
4. *Those attending*
 - 4.1. *Jim Simons*
 - 4.2. *Dick Wever*
 - 4.3. *Joe Kavanagh*
 - 4.4. *Bob Ellerhorst*
 - 4.5. *Doug MacDonald*
 - 4.6. *Ralph J. Stephenson - consultant*
5. *Agenda*
 - 5.1. *Prepare major component laundry list*
 - 5.2. *Identify Black & Veatch drawing issues*
 - 5.3. *Identify long lead items*
 - 5.4. *Prepare summary network model of entire project*
6. *Those involved*
 - 6.1. *Black & Veatch - architects & engineers of record*
 - 6.1.1. *Phil Dimitry - project manager*
 - 6.1.2. *Bruce Van Heest - project engineer - structural*
 - 6.1.3. *Dave Campbell - mechanical engineer*
 - 6.1.4. *Kurt Westermann - electrical engineer*
 - 6.1.5. *Ron Hicks - Instruments & controls (I & C)*
 - 6.2. *Tampella Keeler - steam generator contractor*
 - 6.2.1. *Gerald Hurst - project manager*
 - 6.3. *General Electric - turbine generator contractor*
 - 6.3.1. *P. P. Doersan - project manager*
 - 6.4. *Environmental Elements Corporation - Fabric filter contractor*
 - 6.4.1. *Steve Ritgert - project manager*
 - 6.5. *Michigan State University*
 - 6.5.1. *Joe Kavanagh*
 - 6.5.2. *Bob Ellerhorst*
 - 6.5.3. *Doug MacDonald*
 - 6.5.4. *Dick Wever*
 - 6.5.5. *Jim Simons*
7. *Responsibility codes*
8. *Abbreviations*
9. *Job responsibilities*
 - 9.1. *Joe Kavanagh - project manager*
 - 9.1.1. *Official contact between MSU and B&V*
 - 9.1.2. *Channel for all design and construction contract related matters*
 - 9.1.3. *Responsible for program plan and schedule*
 - 9.1.4. *Responsible for maintaining program budget*

9:58:43 AM - Tuesday, April 2, 1991 (320)

- 9.1.5. *Resident senior electrical engineer*
- 9.2. *Bob Ellerhorst - director of utilites*
 - 9.2.1. *Technical pass through between MSU and project*
 - 9.2.2. *Is the ultimate owner and user*
 - 9.2.3. *Is the UDM for power plant design & operational effectiveness*
- 9.3. *Doug MacDonald - design coordinator*
 - 9.3.1. *Acts as liason between parties relating to owner*
 - Black & Veatch
 - Bob Ellerhorst
 - Engineering
 - 9.3.2. *Construction relations are to be defined*
 - 9.3.3. *Consult on mechanical items*
 - 9.3.4. *Works with jka and rel to identify and resolve design issues*
 - 9.3.5. *Stay on details as directed by rel*
- 9.4. *Jim Simons - project representative*
 - 9.4.1. *Responsible for all field operations during construction*
 - 9.4.2. *Responsible for expediting owner purchased equipment*
 - 9.4.3. *Contact between MSU and all contractors on project*
 - 9.4.4. *Sign all request for payments*
- 9.5. *Dick Wever - construction superintendent*
 - 9.5.1. *Jim Simon reports to Dick Wever*
 - 9.5.2. *Approves actions required of Jim*
- 9.6. *Electrical inspector*
 - 9.6.1. *Works closely with Jim Simons to inspect electrical work during construction*
- 9.7. *Lennie Naeyert - student assistant*
 - 9.7.1. *Registered engineer*
 - 9.7.2. *Taking master's and doctor's work*
 - 9.7.3. *General field administration assistant*
- 10. *Packages - as of April 2, 1991 (wd 320)*
 - 10.1. *62.3401 - Steam generator - furnish & erect*
 - 10.1.1. *Was released for bids ?*
 - 10.1.2. *Has been awarded to Tampella Keeler - November ?, 1990*
 - 10.2. *62.1001 - Turbine generator - furnish & erect*
 - 10.2.1. *Was released for bids ?*
 - 10.2.2. *Has been awarded to General Electrical - November ?, 1990*
 - 10.3. *62.0601 - Cooling tower - furnish & erect*
 - 10.3.1. *Was released for bids ?*
 - 10.3.2. *Has been awarded to Thermal Dynamics - February ?, 1990* /
 - 10.4. *62.0203 - Fabric filter*
 - 10.4.1. *Was released for bids ?*

- 10.4.2. *Has been awarded to Environmental Elements Corporation - February ?, 1991*
- 10.5. *?Distributed control system (dcs) - furnish only with start up service*
 - 10.5.1. *Was issued as a purchase order*
 - 10.5.2. *Was released for bids ?*
 - 10.5.3. *Has been awarded to Bailey Control Company - March 14, 1990*
 - 10.5.4. *Includes purchasing, modifying & start up of motor control centers*
- 10.6. *71.0402 - Site work & concrete foundations*
 - 10.6.1. *Was released for bids March 28, 1991 (wd 317)*
 - 10.6.2. *Bids due April 26, 1991 (330)*
- 10.7. *61.4001 - Structural steel*
 - 10.7.1. *Will be issued for bidding ?*
 - 10.7.2. *Will be presented to July, 1991 Board meeting*
- 10.8. *71.0403 - Architectural and building enclosure*
 - 10.8.1. *Will be issued for bidding ?*
 - 10.8.2. *Was planned for presentation to December, 1991 Board meeting*
 - 10.8.3. *May be presented at October, 1991 Board meeting*
- 10.9. *72.0200 - Mechanical construction*
 - 10.9.1. *Will be issued for bidding ?*
 - 10.9.2. *Was planned for presentation to December, 1991 Board meeting*
 - 10.9.3. *May be presented at October, 1991 Board meeting*
 - 10.9.4. *The latest will be at the December, 1991 Board meeting*
 - 10.9.5. *Still intent of MSU to have this contractor be the prime contractor*
- 10.10. *73.0200 - Electrical construction*
 - 10.10.1. *Will be issued for bidding ?*
 - 10.10.2. *Was planned for presentation to June, 1992 Board meeting*
 - 10.10.3. *May be presented at an earlier Board meeting*
- 10.11. *? Electrical equipment*
 - 10.11.1. *May be purchased by purchase order*
 - 10.11.2. *Includes - partial list*
 - Switch gear
 - Transformers
 - Low voltage sub stations
 - Lighting sub stations?
 - 10.11.3. *Will be issued for bidding?*
 - 10.11.4. *Will be presented to Board ?*
- 10.12. *? Special electrical work in existing plant*
 - 10.12.1. *Will be issued for bidding ?*
 - 10.12.2. *Will be presented to Board ?*

General notes - to be updated as required

1. Long lead items - to be continued

- 1.1. Structural steel
- 1.2. Turbine generator
- 1.3. Fabric filter
- 1.4. Cooling tower
- 1.5. Motor control centers
- 1.6. Switchgear
- 1.7. Transformers
- 1.8. Bus duct
- 1.9. Boiler feed pumps
- 1.10. Attenuator water pumps
- 1.11. High pressure valves
- 1.12. Slate
- 1.13. Brick
- 1.14. Limestone
- 1.15. DCS equipment
 - 1.15.1. Control panels
- 1.16. Primary air fans
- 1.17. Secondary air fans
- 1.18. Induced draft fans
- 1.19. Ash silo
- 1.20. Sand silo
- 1.21. Feed systems
- 1.22. Demineralizer
- 1.23. Closed system cooling system
- 1.24. Conveying equipment

2. Those involved

- 2.1. Bailey Controls Company (bcc) - distributed control system contractor
 - 2.1.1. Ron Walko - president
 - 2.1.2. Steve Ullom - project manager at Wickcliff, Ohio
 - 2.1.3. Larry Brougham - sales representative at Detroit, Michigan
- 2.2. Black & Veatch (b&v) - architects & engineers of record
 - 2.2.1. Phil Dimitry - project manager - go to for overall data & information
 - 2.2.2. Kent Polins - senior project manager
 - 2.2.3. Bruce Van Heest - project engineer - civil & structural
 - 2.2.4. Dave Campbell - mechanical engineer
 - 2.2.5. Kurt Westermann - electrical engineer
 - 2.2.6. Ron Hicks - Instruments & controls (I & C)
 - 2.2.7. Tim Jacobs - in house scheduler
 - 2.2.8. John Kamen - controls engineer
- 2.3. Design & Build - apparent successful bidder - foundation & site - 71.0402
 - 2.3.1. Phil Crockett - president

General notes - to be updated as required

- 2.3.2. *Jim Schiably - field superintendent*
- 2.3.3. *Don Spruit - estimator & expeditor*
- 2.4. *Environmental Elements Corporation - fabric filter contractor*
 - 2.4.1. *Steve Ritgert - project manager at Baltimore, Md*
 - 2.4.2. *John Holbrook - sales representative at Baltimore, Md*
- 2.5. *General Electric - turbine generator contractor*
 - 2.5.1. *P. P. Doersan - project manager at Fitchburg, Mass. - technical*
 - 2.5.2. *Richard O'Conner - contracts manager at Schenecty, NY*
 - All revisions go through Mr. O'Conner
 - 2.5.3. *Randy Majerczak - sales representative in Detroit, Mich*
- 2.6. *Michigan State University - owner*
 - 2.6.1. *Joe Kavanagh - project manager*
 - 2.6.2. *Bob Ellerhorst - director of utilities*
 - 2.6.3. *Doug MacDonald - design coordinator*
 - 2.6.4. *Dick Wever - construction superintendent*
 - 2.6.5. *Jim Simons - project representative*
 - 2.6.6. *Robert Nestle - engineer*
 - 2.6.7. *David Erickson - MSU student employee - came on project 5/29/91*
- 2.7. *Thermal Dynamics - cooling tower - Colorado*
 - 2.7.1. *Mr. Kast - president*
- 2.8. *TPC - Tampella Power (formerly Tampella Keeler) - steam generator contractor*
 - 2.8.1. *Gerald Hersh - project manager (now engineering manager)*
 - 2.8.2. *Dean Ely - project manager*
 - 2.8.3. *Henry Kwon - project engineer - technical*
- 3. *Intermediate milestone dates including issued contract packages*
 - To be abstracted by project team & given to rjs for entering in master notes.
 - 3.1. *62.3401 - Steam generator - furnish & erect*
 - 3.1.1. *03/30/92 (574) - Complete steam drum lift*
 - 3.2. *62.1001 - Turbine generator - furnish & erect*
 - 3.3. *62.0601 - Cooling tower - furnish & erect*
 - 3.3.1. *08/15/92 (671) - Complete setting cooling tower on foundations*
 - 3.3.2. *08/21/92 (676) - Complete fan alignments*
 - 3.3.3. *08/28/92 (681) - Complete operational & functional verifications*
 - 3.3.4. *03/01/93 (808) - Ready for initial operation*
 - 3.3.5. *09/07/93 (941) - Ready for commercial operation*
 - 3.4. *62.0203 - Fabric filter*
 - 3.5. *71.0402 - Site work & concrete foundations*
 - 3.5.1. *06/07/91 (367) - Approve award contract - letter of intent*
 - 3.5.2. *06/20/91 (376) - Mobilize & move on site*
 - 3.5.3. *11/15/91 (481) - Site grading complete*
 - 3.5.4. *12/31/91 (511) - Power plant & associated foundations complete*

General notes - to be updated as required

- 3.5.5. 12/31/91 (511) - Turbine foundations complete
- 3.5.6. 04/03/92 (578) - Cooling tower foundations complete
- 3.5.7.
- 3.6. 61.4001 - Structural steel
 - 3.6.1. 07/26/91 (401) - Contract award
 - 3.6.2. 03/01/92 (553) - Start erection of structural steel
 - 3.6.3. 05/01/92 (598)- Complete erection of boiler room structural steel
To support boiler erection
 - 3.6.4. 07/01/92 (640) - Complete all steel & deck erection & detailing
- 3.7. 71.0403 - Architectural and building enclosure
- 3.8. 72.0200 - Mechanical construction
- 3.9. 73.0200 - Electrical construction
- 4. Abbreviations
 - 4.1. p&id's
 - 4.2. i/o
 - 4.3. rd
 - 4.4. bbc - Bailey Controls Company
 - 4.5. etsi -
 - 4.6. pim - Project instructions manual - b&v in house project document
 - 4.7. b&v - Black & Veatch - architects & engineers of record
 - 4.8. d&b - Design & Build -apparent successful bidder - foundation & site - 71.0402
 - 4.9. dae - David A. Erickson - MSU student employee
 - 4.10. eec - Environmental Elements Corporation - Fabric filter contractor
 - 4.11. gel - General Electric - turbine generator contractor
 - 4.12. jes - James E. Simons - project representative
 - 4.13. msu - Michigan State University
 - 4.14. rwe - Richard Wever - construction superintendent
 - 4.15. tpc - Tampella Power (formerly Tampella Keeler) - steam generator contractor
 - 4.16. rjs - Ralph J. Stephenson, consultant
- 5. Physical characteristics of project
 - 5.1. Location - MSU campus - East Lansing, Michigan
 - 5.2. Footprint sizes
 - 5.2.1. Cooling tower (ctw) -
 - 5.2.2. Cooling tower substation
 - 5.2.3. Electrical & chemical building (ecb)
 - 5.2.4. Existing plant work (epw)
 - 5.2.5. Filter & fabric building (ffb) - 93' x 95' minus corner for stack
 - 5.2.6. Power plant #4 (pp4) - 215' x 80'
 - 5.2.7. Site work (sit)
- 6. Glosssary of terms - started May 23, 1991

General notes - to be updated as required

6.1. *Certified drawings*

Documents that have been completed and certified by the contractor preparing the documents as fully complying with the requirements of the specifications. See general requirements, engineering data, spec section 1C

6.2. *Preliminary drawings*

Drawings not fully completed nor approved by the contractor preparing the drawings. Shall be reasonably complete and suitable for engineer's use in establishing basic plant arrangements and design requirements.

6.3. *Conform specification*

The conform spec is a specification rewritten during pre contract negotiations with design and install contractors. These include the steam generator, turbine generator, cooling tower, fabric filter and distributed control system contracts.

I. 9:58:43 AM - Tuesday, April 2, 1991

A. T. B. Simon Power Plant Unit 4 Addition

B. Location - MSU Physical Plant - East Lansing, Michigan

C. Those attending

1. Jim Simons
2. Dick Weaver
3. Joe Kavanagh
4. Bob Ellenhorst
5. Doug MacDonald
6. Ralph J. Stephenson - consultant

D. Agenda

1. Prepare major component laundry list
2. Identify Black & Veatch drawing issues
3. Identify long lead items
4. Prepare summary network model of entire project

E. Those involved

1. Black & Veatch - architects & engineers of record
 - Phil Dimitry - project manager
 - Bruce Van Heest - project engineer - structural
 - Dave Campbell - mechanical engineer
 - Kurt Westernmann - electrical engineer
 - Ron Hicks - Instruments & controls (I & C)
2. Tampella Keeler - steam generator contractor
 - Gerald Hurst - project manager
3. General Electric - turbine generator contractor
 - P. P. Doersan - project manager
4. Environmental Elements Corporation - Fabric filter contractor
 - Steve Ritgert - project manager
5. Michigan State University
 - Joe Kavanagh
 - Bob Ellenhorst
 - Doug MacDonald
 - Dick Weaver
 - Jim Simons

F. Responsibility codes

G. Abbreviations

H. Job responsibilities

1. Joe Kavanagh - project manager
Official contact between MSU and B&V
Channel for all design and construction contract related matters
Responsible for program plan and schedule
Responsible for maintaining program budget
Resident senior electrical engineer
2. Bob Ellerhorst - director of utilities
Technical pass through between MSU and project
Is the ultimate owner and user
Is the UDM for power plant design & operational effectiveness
3. Doug MacDonald - design coordinator
Acts as liason between parties relating to owner
Black & Veatch
Bob Ellerhorst
Engineering
Construction relations are to be defined
Consult on mechanical items
Works with jka and rel to identify and resolve design issues
Stay on details as directed by rel
4. Jim Simons - project representative
Responsible for all field operations during construction
Responsible for expediting owner purchased equipment
Contact between MSU and all contractors on project
Sign all request for payments
5. Dick Weber - construction superintendent
Jim Simon reports to Dick Weber
Approved with signature of Jim
6. Electrical inspector
Works closely with Jim Simons to inspect electrical work during construction
7. Lennie Naeyert - student assistant
Registered engineer
Taking master's and doctor's work
General field administration assistant

I. Packages - as of April 2, 1991 (wd 320)

T. B. Simon Unit 4, Michigan State University

1. 62.0000 - Structural steel & erect
 - Was released for bids ?
 - Has been awarded to Tampella Keeler - November ?, 1990
2. 62.1001 - Turbine generator - furnish & erect
 - Was released for bids ?
 - Has been awarded to General Electrical - November ?, 1990
3. 62.0601 - Cooling tower - furnish & erect
 - Was released for bids ?
 - Has been awarded to Thermal Dynamics - February ?, 1990
4. 62.0203 - Fabric filter
 - Was released for bids ?
 - Has been awarded to Environmental Elements Corporation - February ?, 1990
5. 20distributed control system (dcs) - furnish only with start up service
 - Was issued as a purchase order
 - Was released for bids ?
 - Has been awarded to Bailey Control Company - March 14, 1990
6. 71.0402 - Site work & concrete foundations
 - March 28, 1991 (317)
 - Bids due April 26, 1991 (330)
7. 71.4001 - Structural steel
 - Will be issued for bidding ?
 - Will be issued for bidding, 1991 Board meeting
8. 71.0403 - Architectural and building enclosure
 - Will be issued for bidding ?
 - Was planned for presentation to December, 1991 Board meeting
 - May be presented at October, 1991 Board meeting
9. 72.0200 - Mechanical construction
 - Will be issued for bidding ?
 - Was planned for presentation to December, 1991 Board meeting
 - May be presented at October, 1991 Board meeting
 - The latest will be at the December, 1991 Board meeting
 - Still intent of MSU to have this contractor be the prime contractor
10. 73.0200 - Electrical construction
 - Will be issued for bidding ?

T. B. Simon Unit 4, Michigan State University

Was planned for presentation to June, 1992 Board meeting

May be presented at an earlier Board meeting

11. ? Electrical equipment

May be purchased by purchase order

Includes - partial list

Switch gear

Transformers

Low voltage sub stations

Lighting sub stations?

Will be issued for bidding?

Will be presented to Board ?

12. ? Special electrical work in existing plant

Will be issued for bidding ?

Will be presented to Board ?