Methane Conversion for Highway Fuel Use

Phase II – Final Implementation Plan
Floating Methanol Plantship

PUBLICATION NO. FHWA-RD-86-202

U.S. Department
of Transportation
**Federal Highway
Administration**

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

METHANE CONVERSION

FOR

HIGHWAY FUEL USE

PHASE II

FINAL IMPLEMENTATION PLAN

FLOATING METHANOL PLANTSHIP

MARCH 1987

FHWA-RD-86-202

PREPARED FOR

DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

400 SEVENTH STREET SW

WASHINGTON, DC 20590

CONTRACT NO. DTFH61-85-C-00076

BY

YANKEE ENERGY

80 BOYLSTON STREET

BOSTON, MA 02111

(617) 482-3124

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA-RD-86-202		

4. Title and Subtitle

METHANE CONVERSION FOR HIGHWAY FUEL USE
(FLOATING PLANT METHANOL PRODUCTION SYSTEM)

5. Report Date
February, 1987

6. Performing Organization Code

7. Author(s)
A. Pastuhov, M. Pepper, F. Booth, J. Calder, C. Fink

8. Performing Organization Report No.
Final Report, Phase II

9. Performing Organization Name and Address

Yankee Energy
80 Boylston Street
Boston, MA 02116

10. Work Unit No. (TRAIS)

11. Contract or Grant No.
DTFH61-85-C-00076

12. Sponsoring Agency Name and Address

Federal Highway Administration
U.S. Department of Transportation
Washington, DC 20590

13. Type of Report and Period Covered
Phase II Final Report
7/28/86 to 2/27/87

14. Sponsoring Agency Code

15. Supplementary Notes
Contracting Officer's Technical Representative for reported work is Dr. W. Clayton Ormsby. Administrative and technical contact for Yankee Energy is Peter J. Booras, President.

16. Abstract

This Phase II Final Report presents implementation plans and quotation assembly drawings for construction of a plantship designed to convert natural gas to methanol. The Phase I Final Report presented an assessment of the technical and economic feasibility of producing fuel grade methanol aboard a floating conversion plant using natural gas from offshore resources uneconomically produced by conventional means, i.e., via a subsea pipeline to shoreside markets. Feasibility in all respects was confirmed. It was determined that fuel methanol production by this means from these resources is cost advantageous as compared with all alternatives at least through the early 21st century. Operations do not adversely affect the environment. The design was executed in full conformance to regulations of EPA, DOT, MMS and U.S. Coast Guard; required license and permits will be obtainable.

Research identified 25 trillion cubic feet (TCF) of appropriate gas in North American waters, and a minimum of 53 TCF in waters adjacent to other continents or islands. These fields can supply 130 plant vessels for 20 years, each producing 3,000 tons of methanol per day (total = 390,000 short ton per day [STPD]); for comparison, domestic gasoline consumption is 850,000 STPD. An analysis shows market penetration first by methanol blends to enhance fuel octane; by the turn of the century substantial "neat" methanol substitution for gasoline and diesel oil will occur. The floating plant displaces 180,000 tons, is 780 ft. long, 200 ft wide and operates at a draft of 55 ft. Synthesis gas is produced by catalytic auto thermal reforming; an ICI synthesis loop converts this to methanol. Construction cost is nominally $250 million; the on-board cost of methanol is nominally 18 cents/gallon; transportation to market via tanker adds 3 cents/gallon.

17. Key Words	18. Distribution Statement
Methanol; ICI Process; Methane Conversion; Plant Vessel; Floating Production System; Autothermal Reactor; Catalytic Partial Oxidation; Alternative Fuel	N/A

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	68	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

FOREWORD

This document presents Phase II results of a two-phase study performed under Contract No. DTFH61-85-C-00076. Phase II developed Quotation Assembly Drawings and an Implementation Plan for a methanol plantship designed in Phase I. The floating plantship converts offshore natural gas to fuel grade methanol.

This document is an accounting of work directed by the following:

SURFACE TRANSPORTATION ASSISTANCE ACT OF 1982

SECTION 152. STUDY OF METHANE CONVERSION FOR HIGHWAY FUEL USE

The Secretary of Transportation shall study, out of any funds available to the Secretary of Transportation for research purposes, the potential for recovering methane which is released in the process of offshore oil drilling and converting such methane on a floating conversion plant located at the drilling site into methane for use as a fuel for highway vehicles. Such study shall include, but need not be limited to, a determination of the quality and quantity of the methane which is released at offshore drilling sites at various locations and the costs involved in recovering such methane and converting it in the manner described in the preceding sentence. The Secretary shall also determine the permitting requirements which would apply to such floating conversion plants and the most effective way to implement those permitting requirements.

NOTICE

The United States Government does not endorse products or manufacturers. Trade or manufacturers' names appear herein only because they are considered essential to the object of this document.

TABLE OF CONTENTS

		Page
FOREWORD		i
DOCUMENTATION PAGE		iii
TABLE OF CONTENTS		iv
EXECUTIVE SUMMARY		1
1.0	PLANTSHIP PROJECT IMPLEMENTATION PLAN	3
1.1	Activity Dependencies	5
2.0	IMPLEMENTATION PLAN FOR OBTAINING PERMITS AND LICENSES	6
2.1	Plantship Permitting and Licenses	6
2.1.1	U.S. Coast Guard Certificates	7
2.1.2	Minerals Management Service (MMS)	10
2.1.3	Environmental Protection Agency (EPA) Permit Requirements	12
2.1.4	Army Corps of Engineers Permit Requirements	13
2.2	Plan/Schedule For Licenses and Permits	14
APPENDIX A	PLANTSHIP CONSTRUCTION ACTIVITY TASK DEPENDENCY TABLE	A.1
ATTACHMENT	PLANTSHIP QUOTATION ASSEMBLY DRAWINGS (Under Separate Cover)	

EXECUTIVE SUMMARY

A two-phase program to assess the technical and economic feasibility of producing fuel grade methanol aboard a floating methanol-to-methanol conversion facility has been completed; feasibility is confirmed in all respects.

The Phase I Final Report submitted in May 1986 determined the sites, quantity and quality of those natural gas resources which would be preferably used by a floating methanol plantship; it forecasted the nature and size of future methanol markets; and finally, it presented the design of the methanol plant, plant vessel and deployment means at that level of detail necessary to perform cost estimation to an accuracy of $\pm$ 20 percent. The Phase I report concludes with recommendations of those administrative actions and legislative initiatives which will assist realization of a methanol fuels future.

This Phase II Final Report presents planning for implementing the methane-to-methanol plantship project. Scheduling is integrated for:

- Acquisition of required permits and licensing;
- Final design of the conversion plant and plant vessel;
- Development of the gas field and plantship mooring;
- Procurement, manufacture and assembly of the plantship; and
- Operating trials, deployment, mooring and activation.

From a commitment to proceed, a period of 44 to 51 months will elapse to first operation of the plantship on-site. Of this, nominally 30 months (2-1/2 years) is required from first component manufacture to vessel completion for start-up of trial dock-side operations. The planning herein discloses that the critical path to project completion proceeds sequentially through financing, permitting, long-lead procurements, system assembly, trials and deployment.

A second aspect of Phase II activity was the preparation of plant and plant vessel quotation assembly drawings, i.e., designs at that level of detail which will permit solicitation of construction bids. This was accomplished, and delivery of the Quotation Assembly Package was made to the Contracting Officer, Federal Highway Administration, under a separate cover.

1.0 PLANTSHIP PROJECT IMPLEMENTATION PLAN

The methanol plantship system is comprised by a series of interconnected subsystems which accomplish the specific function of producing methanol from offshore natural gas. Construction of the plantship proceeds in 10 major areas of activity as shown in Table 1. Each of these activity areas encompasses three or more secondary activities; some 72 generic activities have been identified. Depending on what one identifies as the initiating event, a period of up to 51 months may elapse to first on-site operation of the plantship. Thirty (30) months (2-1/2 years) elapses between first component manufacture and vessel completion for start-up of trial dock-side operations.

Table 1

Plantship Construction Activity Areas

Project Development
Permit Application
Design-Vessel and Field
Design-Process and Module
Procurement-Process and Vessel (Long and Short Lead Time)
Process Module Construction
Vessel Construction
Vessel Completion
Gas Field Development
Vessel Deployment and Start-up

The 10 previously mentioned areas of major activity are all interrelated and, in most instances, the initiation of a specific activity is dependent upon the completion of one or more predecessor events. The objective of developing the planning presented herein has been to identify those specific activities which must be accomplished, to order the sequence of events, to associate performance periods with all events, and by analysis of the whole, to highlight those activities that are critical to completing the construction of the plantship in a minimum of elapsed time.

Figure 1 presents the evolved Summary Implementation Plan for plantship system design, construction and deployment including acquisition of all required permits and licenses; it is based upon the theoretical constructs of program evaluation and review techniques (PERT). The interrelationships between specific activities are identified and dependency relationships established; the critical path, i.e., the constraining sequence of critical activities that must occur on schedule to accomplish plantship construction in the specified time, is illustrated.

Plantship construction activities can be categorized in three broad areas:

(1) Permitting,
(2) Design and Procurement, and
(3) Construction of Vessel and Process Plant/Their Integration.

Each of the three areas are critical to meeting the specified schedule. As the critical path of Figure 1 suggests, the focus of critical activities shifts over time. Specifically, at project outset, critical activities are focused on the general area of permitting, both from the perspective of obtaining access to natural gas resources and from the perspective of obtaining government agency approval of plantship design concepts/details. A discussion of specific permitting activities and requirements is presented in Section ... For purposes of this planning exercise, plantship operation in the western Gulf of Mexico is assumed. This is a region of historic offshore gas/oil exploration/production activity and, as such, there is a high probability that required licenses/permits will issue on a timely basis.

Once the initial permitting activities of the project are accomplished, the focus of the critical path shifts to design-related activities of both the vessel and the process plant. Plantship and process plant construction activities represent the major focus of critical activities during the second half of scheduled events presented in Figure 1. At the outset of this second half of scheduled activities, vessel construction assumes the most critical role. Later, outfitting the vessel with the methanol process modules is controlling; this commences approximately nine months prior to deployment and start-up and is the last critical activity in vessel completion.

1.1 Activity Dependencies

Each activity necessary to plantship project completion and those activities whose initiation is dependent upon completion of a predecessor activity, are presented in Appendix A. Dependency relationships between activities are presented as dashed vertical lines in Figure 1. Presenting the entire activity dependency network as contained in Appendix A would render a work flow diagram such as Figure 1 unusable due to a surfeit of work elements. Therefore, subsidiary dependency networks, much like Figure 1 but for various activity groups, would be developed to supplement Figure 1 prior to project initiation.

2.0 IMPLEMENTATION PLAN FOR OBTAINING PERMITS AND LICENSES

Data on plantship operations, designs, and effluent levels, as the subject matter of licenses and permits, are presented in great detail in the Phase I Final Report. This Phase II report restricts comments to those that pertaining to the scheduling for applications for, and the receipt of, required licenses and permits.

2.1 Plantship Permitting and Licensing

The construction and operation of a ship-based methanol production facility requires a series of permits, licenses, certificates and regulatory agency concurrence. There are six broad areas of permitting and licensing that must be considered during plantship construction and subsequent operation. These areas include:

(1) Plantship vessel construction;
(2) Plantship process licensing;
(3) Offshore gas resource leasing (if applicable);
(4) Plantship operations;
(5) Plantship movements; and
(6) Storage, offloading and transportation of methanol.

Authority to issue permits and licenses (exclusive of methanol production process licensing) in these areas resides primarily with four federal agencies: the U.S. Coast Guard (USCG), the Environmental Protection Agency (EPA), and the Minerals Management Service (MMS) and the U.S. Army Corps of Engineers. Additionally, for a plantship operating in state-controlled waters, the individual state would require the issuance of a state gas resources lease. This is, however, a somewhat unlikely circumstance given the nature and economics of gas field development and the resource requirements of the methanol plantship. Specifically, plantships typically address remote gas fields whereas gas resources on state leases are most economically and preferentially exploited via pipelines to shore.

2.1.1 U.S. Coast Guard Certificates

The applicable Coast Guard regulations for a floating methanol plant are contained in 46 CFR 30-40. These regulations apply to tank vessels carrying bulk flammable liquids. They cover requirements for tank vessel materials, design, construction, inspection, manning and operations including stowage of cargo and the duties of officers and crew.

Applicable requirements for a floating methanol plant are divided into five parts as follows:

(1) Inspection and Certification requirements (Table 2);
(2) Special equipment, machinery, and hull requirements;
(3) Lifesaving appliances;
(4) Firefighting equipment; and
(5) Operations.

Prior to and during plantship construction, the USCG is actively involved in the resolution of specific questions concerning the applicability of certain regulations, the review and approval of detailed plantship design, and the inspection of construction as it progresses to completion.

Table 2

USCG/ABS Certifications That Will or May Be Required for a Methanol Plantship

- Certificate of Vessel Inspection
- International Safety of Life at Sea Certification (requirement to be resolved)
- Oil Pollution Prevention Certificate
- Load Line Certificate
- Admeasurement Certificate
- Financial Responsibility Certificate

Schedule allowance is made for a reasonable period of time (3-6 months) to identify and make a final determination on certain specific questions related to precise plantship certification requirements. For example, will plantship documents of certification be based solely on 40 CFR 30, subpart D (Tank Vessels), or will compliance with Subparts I (Cargo and Miscellaneous Vessels) and/or Subpart D (Dangerous Cargos) also be required? Similarly, will a Safety of Life at Sea (SOLUS) certificate be required in that the plantship is not self-propelled, but will have a sizeable contingent on board? These and other specific questions still require final resolution with appropriate USCG offices. Accordingly, a block of time has been included in the Figure 2 timeline for this purpose.

Plans and specifications of the vessel (i.e., the floating methanol plant) are required to be submitted to the Coast Guard Marine Safety Center for approval. Review of plans typically requires about 4-6 months. If the plans and specifications are found to be in substantial agreement with Coast guard regulations, they are then approved. During construction, the vessel is inspected on an ongoing basis by representatives of the cognizant Coast Guard District Marine Inspection Division to assure that it is built in accordance with approved plans.

Prior to vessel certification, it must meet stability requirements that involve the approval of stability calculations. Stability calculations are reviewed by the American Bureau of Shipping and evaluated by the USCG. A USCG Certificate of Inspection is issued after satisfactory inspection of the vessel. Among other things, the Certificate of Inspection states the number and type of officers and crew required to operate the vessel safely.

After the vessel is built and operating, it must be placed in a drydock or hauled out for examination at intervals not to exceed 24 months when it operates in salt water. If a plan for on-site examination is submitted, reviewed and approved, then drydocking can be avoided.

Other important requirements include the following:

- Load line regulations, 46 CFR 42-46;

- Marine engineering regulations, 46 CFR 50-63;

- Electrical engineering regulations 46 CFR 110-113;

- Inspection of cargo gear, 46 CFR 31.37;

- Certificate Under International Convention for Safety of Life at Sea, 1960, 46 CFR 31.40;

- Special equipment machinery, and hull requirements, such as, navigation equipment, electrical installations, pumps, piping, cargo hose, inert gas systems, ventilation and venting and fire protection, 46 CFR 32; and

- Operations requirements such as work vests, logbook entries, fire and emergency requirements, and cargo handling, 46 CFR 35.

Coast Guard regulations that address Outer Continental Shelf Activities are found in 33 CFR 140-147. The purpose of these regulations is to promote safety of life and property on Outer Continental Shelf (OCS) facilities, vessels, and other units engaged in OCS activities, protect the marine environment, and implement the Outer Continental Shelf Lands Act. These regulations are in addition to the regulations and orders of the U.S. Geological Survey applicable to OCS facilities. The regulations do not establish design requirements for fixed OCS facilities or regulate drilling or production equipment on any OCS facility or attending vessel, except for matters affecting navigation or work-place safety or health. In accordance with the regulations, a facility engaged in OCS activities is subject to inspection by the Coast Guard. A holder of a lease or permit must ensure that all places of employment within the lease area or within the area covered by the permit on the OCS are maintained in compliance with work-place safety and health regulations and free from recognized hazards.

Safety zones may be established around facilities operated on the Outer Continental Shelf to promote the safety of life and property on the facilities, their appurtenances and attending vessels, and on the adjacent waters

within the safety zones. Regulations adopted for safety zones may extend to the prevention or control of specific activities and access by vessels or persons, and include measures to protect the living resources of the sea from harmful agents. Before establishing a safety zone, the Coast Guard considers all relevant safety factors, including existing or reasonably foreseeable congestion of vessels, the presence of unusually harmful or hazardous substances and any obstructions within 500 meters of the OCS facility. A safety zone extends to a maximum distance of 500 meters around the OCS facility measured from each point on its outer edge as long as it does not interfere with the use of recognized sea lanes essential to navigation.

Other pertinent regulations in Title 33 relating to the operation of a floating methanol plant are oil pollution regulations (33 CFR 151). The purpose of these regulations is to implement the 1980 Act to Prevent Pollution from Ships, and the provisions of the 1973 International Convention for the Prevention of Pollution from Ships, as modified by the 1978 Protocol. The provisions to be implemented are: requirements for the Oil Record Book, requirements for the International Oil Pollution Prevention, (IOPP), certificates, survey and inspection requirements, discharge limitations, the description of special areas, reporting requirements, emergency discharge exceptions and enforcement for the prevention of pollution of the sea by oil.

Special requirements for lightering of oil and hazardous material cargo (33 CFR 156.200) may be applicable because the proposed floating methanol plant will be transferring methanol to tankers or barges for shipment to shore based facilities. Lightering operations involving hazardous materials, other than oil, may be conducted only with special approval from the Coast Guard.

2.1.2 Minerals Management Service (MMS)

MMS permit requirements, as applied to the operation of an offshore methanol production plantship, basically address the environmental aspects of plantship operations. The holder of the MMS lease is required to submit an exploration and drilling plan describing proposed activities on the lease site. Upon gaining exploration plan concurrence from coastal zone management officials in the onshore state adjacent to the lease, an exploration and

development permit is granted. An environmental assessment which identifies and quantifies environmental, energy and socioeconomic impacts both on the lease site and in onshore areas is typically part of the information submitted to MMS in the exploration and drilling plan. Often, the lease holder prepares the environmental assessment to expedite processing of the permit application. Other agencies and regulators (EPA, USCG, Corps of Engineers) also use portions of the environmental assessment in their permit and certification processing.

Prior to the commercial production of gas from a MMS lease, a resource production plan is submitted to gain an MMS production permit. Included in the production plan is environmental information related to the anticipated offshore and onshore impacts of gas production at the site. Concurrence of the onshore coastal zone management commission is also required prior to MMS issuance of a production permit.

The location of the MMS gas lease will play a large role in determining the complexity of production permit application requirements. For example, in the Gulf of Mexico, it is likely that no Environmental Impact Statement (EIS) would be required, whereas in the Atlantic region, an EIS would most likely be required due to the absence of any existing oil or gas development.

The time requirements to obtain either an exploration/development permit or a production permit vary significantly. Examples of two to three months were cited in the Gulf of Mexico by MMS, but it was also stated that obtaining onshore coastal zone management commission concurrence had, in some instances off the coast of California, required several years. Additionally, the information requirements vary significantly and are dependent on the selected operating site. A precise time requirement to obtain MMS permits cannot be specified. Because of the potential for a relatively long period to gain the permits, exploration and development or production plans, including any required environmental data, will be submitted during the first 12 to 24 months of plantship equipment and material procurement. This will allow approximately 2 to 3 years to generate and submit any additional information required, gain onshore coastal zone management commission

concurrence and obtain the necessary MMS permit(s). As noted in paragraph 1.0, assumed first operation will be the western U.S. Gulf of Mexico; as such, the shorter periods discussed in the foregoing are expected to prevail.

2.1.3 Environmental Protection Agency (EPA) Permit Requirements

The EPA role in offshore oil and gas production, and subsequently, the conversion of natural gas to methanol, is focused on maintaining air and water quality and in ensuring that provision has been made for remedial action responses to accidental release of hazardous or toxic materials. A methanol plantship would be considered as a point source in the event of any discharge to water bodies, and theoretically would require a National Pollution Discharge Elimination System (NPDES) permit prior to operation. Practically, because of it's intended site of operation, the cognizant EPA regional office could grant a waiver for a NPDES permit. This waiver would be a reflection of the lead role of MMS in regulating offshore activities. In practice, the MMS environmental regulations are highly similar to EPA regulations. An application for the permit must be submitted to obtain a waiver. To expedite the EPA permit or waiver of required NPDES permits, application would be made concurrently with the submission of MMS gas lease development or production plan information, and particularly the environmental assessment of methanol plantship production operations. Regional EPA offices have indicated that sufficient lead time should be incorporated in the NPDES permit application process for EPA to adequately evaluate what will be a rather unusual permit application. Specifically, sufficient time should be allocated for EPA to develop an Ocean Discharge Criteria Evaluation (ODCE) document under Section 403(c) of the Clean Water Act. In terms of time required, the NPDES permit will require 90 to 120 days to process. Additionally, approximately four to six months should be allowed for the preparation of an ODCE document.

Air emissions from the methanol plantship and from shuttle tankers carrying methanol to shore based marine terminals are regulated by the Clean Air Act (CAA) of 1970. The methanol plantship, because it will emit more than 100 tons/year of regulated pollutants (Volatile Organic Compounds [VOC], CO, CO_2, NO_x, SO_x, Lead, or Ozone) will be categorized as a New Source and would be

subject to a New Source Review. However, in practice, the EPA defers on regulation of air emissions to the MMS. If an MMS production permit is obtained, limitations on air emissions will be an integral part of the permit.

In addition to emissions from the plantship proper, air emissions from the tanker(s) transporting methanol to ore based marine terminals will also be regulated by EPA and/or State air regulation authorities.

The EPA and the USCG have jurisdiction in the event of a methanol spill. Spill contingency response plans must be developed and reviewed prior to either plantship operation or shuttle tanker operation. The physical and chemical characteristics of methanol when spilled, e.g., toxicity, solubility, etc., coupled with the potential spill location will provide a basis for developing the alternative spill response plans. Information submitted to EPA and MMS as part of the environmental assessment of plantship operations represents most, if not all, of the information required for the spill contingency response plan.

2.1.4 Army Corps of Engineers Permit Requirements

The U.S. Army Corps of Engineers has jurisdiction on structures permanently affixed in navigable waters. This authority is based on the Rivers and Harbors Act of 1899 which authorizes the Corps to regulate navigable waters. The methanol plantship represents a structure permanently affixed to the seafloor in navigable waters and thus requires a Corps of Engineers permit. Typically, the permit process requires 30 to 60 days for processing. However, due to the uniqueness of the project, coupled with potential environmental impacts, an environmental assessment might be required. The environmental data generated in support of the MMS lease production plan and permit application should suffice to meet Corps requirements. The permit application to place a structure in navigable waters will be submitted concurrent with other permit applications (EPA, MMS). This will allow sufficient time for resolution of questions, issues, and will result in the issuance of a Corps permit prior to the completion of plantship construction.

2.2 Plan/Schedule for Licenses and Permits

A generalized lapsed time plan/schedule for acquiring the permits and licenses necessary to construct, deploy, and operate the methanol plantship appears in Figure 2. It has been integrated into the Summary Implementation Plan of Figure 1 (as have detailed schedules for the methanol plant and vessel).

Table 3 presents a current listing of the persons who would be contacted at the various agencies to initiate and pursue licenses and permits.

FIGURE 2

SCHEDULE REQUIREMENTS: PERMITS AND LICENSES FOR CONSTRUCTION, DEPLOYMENT AND OPERATION METHANOL PLANTSHIP IMPLEMENTATION PLAN INPUTS

USCG

- resolve specific questions
- submit detailed plans for MSC review
- MSC Detailed Plan approval
- initiate construction → construction complete
- develop and execute design change orders stemming from Detailed Plan review
- USCG Marine Safety Officer - Construction Inspection (ongoing)
- USCG/MMS initiate applications for various certificates 12-15 months prior completion of construction - see Table for listing
- receive USCG/ABS certifications

MMS

- initiate detailed contacts with Regional Office resolve questions, issues
- develop and submit to regional office a lease production plan, including environmental assessment
- obtain gas production permit

EPA

- initiate detailed contacts with Regional Office
- submit environmental data to regional office as part of application for NPDES and PSD permits
- obtain permit

* Assumes 40 months for plantship construction.

TABLE 3

Contact List - Permits, Certifications and Licensing

USCG Marine Safety Center

Cdr. John Maxhan - (202) 267-0795
Hull Division - Lt. Cdr. Barnett - 267-0509

Environmental Coordination

Lt. Cdr. Pascal - (202) 267-0421

Merchant Vessel Inspection and Documentation Division
Compliance and Enforcement

Cdr. Paul Pluta/Mr. Hal Cahoon - (202) 267-1464

Baltimore District - Marine Safety Inspection Division

Mr. Miante - (301) 967-5121

EPA Headquarters

Air Regulations - Mr. Michael Shelby - (202) 382-5490
Water Regulations (Marine Operations) - Mr. Jonathon Amson - 475-7130
General Counsel's Office - Haz. Mat'l Spill Contingency Plan -
Mr. Jack Kooyoomjian - 382-4130
Region 3 - Philadelphia - Bill Muir - (215) 597-2541
Region 6 - New Orleans - Bob Vickery - H_2O - (214) 767-2765
Tom Diggs - Air - (214) 767-9873

MMS - Headquarters

Lease Exploration - Branch Chief - Gerald Daniels - (202) 648-7827
Offshore Inspection and Enforcement - Marshall Courtois - 648-7750
Dept. Assoc. Director for Offshore Operations - OCS Operations -
Richard Krahl - 648-7809
Atlantic Regional Office - (703) 285-2165
G.O.M. Regional Office - Lowell G. Hammonds, Chief - (504) 736-2589

APPENDIX A

PLANTSHIP CONSTRUCTION ACTIVITY TASK DEPENDENCY TABLE

Activity: #1 PROJECT DEVELOPMENT Date: 01/22/1987

Early Start: 07/01/1987 Early Finish: 07/01/1987
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

# Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
NONE			

Successors:

# Activity:	EARLY START	LATE START	SLACK AVAIL
NONE			

Activity: #2 Pre-Project Engineering Date: 01/22/1987

Early Start: 07/01/1987 Early Finish: 12/31/1987
Late Start : 07/02/1987 Late Finish : 01/01/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

# Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
NONE			

Successors:

# Activity:	EARLY START	LATE START	SLACK AVAIL
5 ----------	01/01/1988	01/03/1988	1

Activity: #3 Gas Supply Contracting

Date: 01/22/1987

Early Start: 09/01/1987
Late Start : 09/03/1987

Early Finish: 10/30/1987
Late Finish : 11/03/1987

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
	NONE			

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
4	Finance Contracting	11/02/1987	11/04/1987	2
5	----------	101/01/1988	01/03/1988	1

Activity: #4 Finance Contracting

Date: 01/22/1987

Early Start: 11/02/1987
Late Start : 11/04/1987

Early Finish: 12/30/1987
Late Finish : 01/01/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
3	Gas Supply Contracting	10/30/1987	11/03/1987	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
5	----------	101/01/1988	01/03/1988	1

Activity: #5 ----------1 Date: 01/22/1987

Early Start: 01/01/1988 Early Finish: 01/01/1988
Late Start : 01/03/1988 Late Finish : 01/03/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
2	Pre-Project Engineering	12/31/1987	01/01/1988	1
3	Gas Supply Contracting	10/30/1987	11/03/1987	2
4	Finance Contracting	12/30/1987	01/01/1988	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
6	PERMIT APPLICATION	01/01/1988	09/30/1991	976
7	USCG - Concept Discussions	03/01/1988	07/13/1988	96
20	DESIGN - VESSEL & FIELD	01/01/1988	01/05/1988	2
26	Prep Field Development Plan	05/24/1988	05/26/1988	2
30	DESIGN - PROCESS & MODULE	01/01/1988	01/03/1988	1

Activity: #6 PERMIT APPLICATION Date: 01/22/1987

Early Start: 01/01/1988 Early Finish: 01/01/1988
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
5	----------101/01/1988		01/03/1988	1

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			

Activity: #7 USCG - Concept Discussions Date: 01/22/1987

Early Start: 03/01/1988 Early Finish: 05/23/1988
Late Start : 07/13/1988 Late Finish : 10/04/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
5	----------	01/01/1988	01/03/1988	1
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
8	USCG - Basic Design Approval	06/09/1988	10/05/1988	84

Activity: #8 USCG - Basic Design Approval Date: 01/22/1987

Early Start: 06/09/1988 Early Finish: 12/14/1988
Late Start : 10/05/1988 Late Finish : 04/11/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
7	USCG - Concept Discussions	05/23/1988	10/04/1988	96
22	Layout & Module Concept	05/30/1988	06/08/1988	7
36	Plant Layout Studies	06/08/1988	06/08/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
56	Vessel Const. Contract Nego.	04/12/1989	04/12/1989	0

Activity: #9 USCG - Final Design Approval Date: 01/22/1987

Early Start: 06/15/1989 Early Finish: 12/20/1989
Late Start : 10/26/1990 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
23	Vess Contract Design	10/04/1988	10/04/1988	0
38	Prep Piping Isometrics	02/08/1989	02/23/1989	11
40	Module Struct Design	06/14/1989	06/29/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45

Activity: #10 USCG - Certificates Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 02/28/1991
Late Start : 11/03/1989 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45
42	----------	408/30/1989	09/14/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45

Activity: #11 MMS - Concept Discussions

Date: 01/22/1987

Early Start: 03/01/1988
Late Start : 03/03/1988

Early Finish: 05/23/1988
Late Finish : 05/25/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
26	Prep Field Development Plan	05/24/1988	05/26/1988	2

Activity: #12 MMS - Field Devel/Envir Assess

Date: 01/22/1987

Early Start: 10/17/1988
Late Start : 10/19/1988

Early Finish: 04/07/1989
Late Finish : 04/11/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
26	Prep Field Development Plan	10/14/1988	10/18/1988	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
56	Vessel Const. Contract Nego.	04/12/1989	04/12/1989	0
71	GAS FIELD DEVELOPMENT	04/07/1989	08/03/1989	84
74	Procure Moor, Riser & Flowline	04/10/1989	07/06/1990	324

Activity: #13 MMS - Final Permit Review Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 03/08/1990
Late Start : 10/26/1990 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45
42	----------	408/30/1989	09/14/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45

Activity: #14 ABS - Concept Review Date: 01/22/1987

Early Start: 03/01/1988 Early Finish: 05/23/1988
Late Start : 03/17/1988 Late Finish : 06/08/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
23	Vess Contract Design	06/09/1988	06/09/1988	0

CRITICAL

Activity: #15 ABS - Basic Design Review Date: 01/22/1987

Early Start: 10/05/1988 Early Finish: 04/11/1989
Late Start : 10/05/1988 Late Finish : 04/11/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
23	Vess Contract Design	10/04/1988	10/04/1988	0
33	Prelim Process & Inst Diag	08/24/1988	09/08/1988	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
56	Vessel Const. Contract Nego.	04/12/1989	04/12/1989	0

Activity: #16 ABS - Detail Plan Review Date: 01/22/1987

Early Start: 06/15/1989 Early Finish: 11/08/1989
Late Start : 06/30/1989 Late Finish : 11/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
23	Vess Contract Design	10/04/1988	10/04/1988	0
38	Prep Piping Isometrics	02/08/1989	02/23/1989	11
40	Module Struct Design	06/14/1989	06/29/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45
59	Hull Steelwork Fabrication	11/24/1989	11/24/1989	0

Activity: #17 Army Corp of Engr Review Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 11/23/1989
Late Start : 02/08/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45

Activity: #18 EPA Spill Contingency Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 11/30/1989
Late Start : 02/01/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
19	----------	202/28/1991	05/02/1991	45

Activity: #19 ----------2 Date: 01/22/1987

Early Start: 02/28/1991
Late Start : 05/02/1991

Early Finish: 02/28/1991
Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
9	USCG - Final Design Approval	12/20/1989	05/02/1991	356
10	USCG - Certificates	02/28/1991	05/02/1991	45
13	MMS - Final Permit Review	03/08/1990	05/02/1991	300
16	ABS - Detail Plan Review	11/08/1989	11/23/1989	11
17	Army Corp of Engr Review	11/23/1989	05/02/1991	375
18	EPA Spill Contingency	11/30/1989	05/02/1991	370

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
78	DEPLOYMENT AND START-UP	05/02/1991	05/02/1991	0

Activity: #20 DESIGN - VESSEL & FIELD Date: 01/22/1987

Early Start: 01/01/1988
Late Start : 01/05/1988

Early Finish: 01/01/1988
Late Finish : 01/05/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
5	----------1	01/01/1988	01/03/1988	1

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
21	Vessel Concept Develop	01/04/1988	01/06/1988	2

Activity: #21 Vessel Concept Develop Date: 01/22/1987

Early Start: 01/04/1988 Early Finish: 02/29/1988
Late Start : 01/06/1988 Late Finish : 03/02/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
20	DESIGN - VESSEL & FIELD	01/01/1988	01/05/1988	2
30	DESIGN - PROCESS & MODULE	01/01/1988	01/03/1988	1

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
7	USCG - Concept Discussions	03/01/1988	07/13/1988	96
11	MMS - Concept Discussions	03/01/1988	03/03/1988	2
14	ABS - Concept Review	03/01/1988	03/17/1988	12
22	Layout & Module Concept	03/01/1988	03/10/1988	7
26	Prep Field Development Plan	05/24/1988	05/26/1988	2
29	----------	308/31/1989	11/02/1989	45

Activity: #22 Layout & Module Concept Date: 01/22/1987

Early Start: 03/01/1988 Early Finish: 05/30/1988
Late Start : 03/10/1988 Late Finish : 06/08/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
8	USCG - Basic Design Approval	06/09/1988	10/05/1988	84

23	Vess Contract Design	06/09/1988	06/09/1988	0
28	Mooring and Riser Sys Design	10/17/1988	01/04/1989	57
29	----------	308/31/1989	11/02/1989	45
39	Module Concept Development	06/09/1988	10/28/1988	101

CRITICAL

Activity: #23 Vess Contract Design Date: 01/22/1987

Early Start: 06/09/1988 Early Finish: 10/04/1988
Late Start : 06/09/1988 Late Finish : 10/04/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
14	ABS - Concept Review	05/23/1988	06/08/1988	12
22	Layout & Module Concept	05/30/1988	06/08/1988	7
32	Dev Major Equip Specs	04/27/1988	05/12/1988	11
36	Plant Layout Studies	06/08/1988	06/08/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
9	USCG - Final Design Approval	06/15/1989	10/26/1990	356
15	ABS - Basic Design Review	10/05/1988	10/05/1988	0
16	ABS - Detail Plan Review	06/15/1989	06/30/1989	11
25	Module Connection Design	10/05/1988	12/02/1988	42
29	----------	308/31/1989	11/02/1989	45

CRITICAL

Activity: #24 Vess Detailed Design Date: 01/22/1987

Early Start: 05/10/1989 Early Finish: 08/31/1989
Late Start : 05/10/1989 Late Finish : 08/31/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
25	Module Connection Design	12/27/1988	02/23/1989	42
56	Vessel Const. Contract Nego.	05/09/1989	05/09/1989	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45
57	Vess Mat'l Procurement	09/01/1989	09/01/1989	0
58	Vess Eqpt Procurement	09/01/1989	09/01/1989	0

Activity: #25 Module Connection Design Date: 01/22/1987

Early Start: 10/05/1988 Early Finish: 12/27/1988
Late Start : 12/02/1988 Late Finish : 02/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
23	Vess Contract Design	10/04/1988	10/04/1988	0
36	Plant Layout Studies	06/08/1988	06/08/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
24	Vess Detailed Design	05/10/1989	05/10/1989	0
29	----------308/31/1989		11/02/1989	45
40	Module Struct Design	02/09/1989	02/24/1989	11
41	Mech & Elect Det'l Design	02/09/1989	03/10/1989	21

Activity: #26 Prep Field Development Plan Date: 01/22/1987

Early Start: 05/24/1988 Early Finish: 10/14/1988
Late Start : 05/26/1988 Late Finish : 10/18/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
5	----------101/01/1988		01/03/1988	1
11	MMS - Concept Discussions	05/23/1988	05/25/1988	2
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
12	MMS - Field Devel/Envir Assess	10/17/1988	10/19/1988	2

28	Mooring and Riser Sys Design	10 17 1988	01 04 1989	57
29	----------	08/31/1989	11/02/1989	45
71	GAS FIELD DEVELOPMENT	04/07/1989	08/03/1989	84

Activity: #27 Specify Subsea and Well Eqpt Date: 01/22/1987

Early Start: 02/15/1989 Early Finish: 05/16/1989
Late Start : 05/05/1989 Late Finish : 08/03/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
28	Mooring and Riser Sys Design	02/14/1989	05/04/1989	57

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
29	----------	308/31/1989	11/02/1989	45
72	Procure Subsea, Flow. & Riser	05/17/1989	08/04/1989	57

Activity: #28 Mooring and Riser Sys Design Date: 01/22/1987

Early Start: 10/17/1988 Early Finish: 02/14/1989
Late Start : 01/04/1989 Late Finish : 05/04/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
22	Layout & Module Concept	05/30/1988	06/08/1988	7
26	Prep Field Development Plan	10/14/1988	10/18/1988	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
27	Specify Subsea and Well Eqpt	02/15/1989	05/05/1989	57
29	----------	308/31/1989	11/02/1989	45
74	Procure Moor, Riser & Flowline	04/10/1989	07/06/1990	324

Activity: #29 ----------3 Date: 01/22/1987

Early Start: 08/31/1989 Early Finish: 08/31/1989
Late Start : 11/02/1989 Late Finish : 11/02/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
21	Vessel Concept Develop	02/29/1988	03/02/1988	2
22	Layout & Module Concept	05/30/1988	06/08/1988	7
23	Vess Contract Design	10/04/1988	10/04/1988	0
24	Vess Detailed Design	08/31/1989	08/31/1989	0
25	Module Connection Design	12/27/1988	02/23/1989	42
26	Prep Field Development Plan	10/14/1988	10/28/1988	2
27	Specify Subs and Well Eqpt	05/16/1989	08/23/1989	57
28	Moor and er Sys Design	02/14/1989	05/ /1989	57

Successors

#	Activity:	EARLY START	LATE START	SLACK AVAIL
10	USCG - Certificates	09/01/1989	11/03/1989	45
13	MMS - Final Permit Review	09/01/1989	10/26/1990	300
17	Army Corp of Engr Review	09/01/1989	02/08/1991	375
18	EPA Spill Contingency	09/01/1989	02/01/1991	370

Activity: #30 DESIGN - PROCESS & MODULE Date: 01/22/1987

Early Start: 01/01/1988 Early Finish: 01/01/1988
Late Start : 01/03/1988 Late Finish : 01/03/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
5	----------1	01/01/1988	01/03/1988	1

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
21	Vessel Concept Develop	01/04/1988	01/06/1988	2
31	Prep Process Flow Diagrams	01/04/1988	01/04/1988	0

CRITICAL

Activity: #31 Prep Process Flow Diagrams Date: 01/22/1987

Early Start: 01/04/1988 Early Finish: 02/29/1988
Late Start : 01/04/1988 Late Finish : 02/29/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
30	DESIGN - PROCESS & MODULE	01/01/1988	01/03/1988	1

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
7	USCG - Concept Discussions	03/01/1988	07/13/1988	96
11	MMS - Concept Discussions	03/01/1988	03/03/1988	2
14	ABS - Concept Review	03/01/1988	03/17/1988	12
22	Layout & Module Concept	03/01/1988	03/10/1988	7
26	Prep Field Development Plan	05/24/1988	05/26/1988	2
32	Dev Major Equip Specs	03/01/1988	03/16/1988	11
36	Plant Layout Studies	03/01/1988	03/01/1988	0

Activity: #32 Dev Major Equip Specs Date: 01/22/1987

Early Start: 03/01/1988 Early Finish: 04/27/1988
Late Start : 03/16/1988 Late Finish : 05/12/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
23	Vess Contract Design	06/09/1988	06/09/1988	0
33	Prelim Process & Inst Diag	04/28/1988	05/13/1988	11
44	Major Eqpt Inquiry & Bid	04/28/1988	06/21/1988	38

Activity: #33 Prelim Process & Inst Diag Date: 01/22/1987

Early Start: 04/28/1988 Early Finish: 08/24/1988
Late Start : 05/13/1988 Late Finish : 09/08/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
32	Dev Major Equip Specs	04/27/1988	05/12/1988	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
15	ABS - Basic Design Review	10/05/1988	10/05/1988	0
34	Final Process & Inst Diag	08/25/1988	10/14/1988	36
35	Instrumentation Det'l Design	08/25/1988	09/09/1988	11
37	Piping Design Model	08/25/1988	09/09/1988	11
38	Prep Piping Isometrics	11/17/1988	12/02/1988	11

Activity: #34 Final Process & Inst Diag Date: 01/22/1987

Early Start: 08/25/1988 Early Finish: 01/04/1989
Late Start : 10/14/1988 Late Finish : 02/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
33	Prelim Process & Inst Diag	08/24/1988	09/08/1988	11
45	Maj Eqpt Ordering	08/22/1988	10/13/1988	38
36	Plant Layout Studies	06/08/1988	06/08/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
40	Module Struct Design	02/09/1989	02/24/1989	11
41	Mech & Elect Det'l Design	02/09/1989	03/10/1989	21

Activity: #35 Instrumentation Det'l Design Date: 01/22/1987

Early Start: 08/25/1988 Early Finish: 08/30/1989
Late Start : 09/09/1988 Late Finish : 09/14/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
33	Prelim Process & Inst Diag	08/24/1988	09/08/1988	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
42	----------	08/30/1989	09/14/1989	11

CRITICAL

Activity: #36 Plant Layout Studies Date: 01/22/1987

Early Start: 03/01/1988 Early Finish: 06/08/1988
Late Start : 03/01/1988 Late Finish : 06/08/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
31	Prep Process Flow Diagrams	02/29/1988	02/29/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
8	USCG - Basic Design Approval	06/09/1988	10/05/1988	84
23	Vess Contract Design	06/09/1988	06/09/1988	0
25	Module Connection Design	10/05/1988	12/02/1988	42
34	Final Process & Inst Diag	08/25/1988	10/14/1988	36
37	Piping Design Model	08/25/1988	09/09/1988	11
39	Module Concept Development	06/09/1988	10/28/1988	101
40	Module Struct Design	02/09/1989	02/24/1989	11

Activity: #37 Piping Design Model Date: 01/22/1987

Early Start: 08/25/1988 Early Finish: 11/16/1988
Late Start : 09/09/1988 Late Finish : 12/01/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
33	Prelim Process & Inst Diag	08/24/1988	09/08/1988	11
36	Plant Layout Studies	06/08/1988	06/08/1988	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
38	Prep Piping Isometrics	11/17/1988	12/02/1988	11

Activity: #38 Prep Piping Isometrics Date: 01/22/1987

Early Start: 11/17/1988 Early Finish: 02/08/1989
Late Start : 12/02/1988 Late Finish : 02/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
33	Prelim Process & Inst Diag	08/24/1988	09/08/1988	11
37	Piping Design Model	11/16/1988	12/01/1988	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
9	USCG - Final Design Approval	06/15/1989	10/26/1990	356
16	ABS - Detail Plan Review	06/15/1989	06/30/1989	11
40	Module Struct Design	02/09/1989	02/24/1989	11
41	Mech & Elect Det'l Design	02/09/1989	03/10/1989	21
47	Bulk Mat'ls Procurement	06/15/1989	08/04/1989	36

Activity: #39 Module Concept Development Date: 01/22/1987

Early Start: 06/09/1988 Early Finish: 10/05/1988
Late Start : 10/28/1988 Late Finish : 02/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
36	Plant Layout Studies	06/08/1988	06/08/1988	0
22	Layout & Module Concept	05/30/1988	06/08/1988	7

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
40	Module Struct Design	02/09/1989	02/24/1989	11
41	Mech & Elect Det'l Design	02/09/1989	03/10/1989	21

Activity: #40 Module Struct Design Date: 01/22/1987

Early Start: 02/09/1989 Early Finish: 06/14/1989
Late Start : 02/24/1989 Late Finish : 06/29/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
25	Module Connection Design	12/27/1988	02/23/1989	42
34	Final Process & Inst Diag	01/04/1989	02/23/1989	36
36	Plant Layout Studies	06/08/1988	06/08/1988	0
38	Prep Piping Isometrics	02/08/1989	02/23/1989	11
39	Module Concept Development	10/05/1988	02/23/1989	101

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
9	USCG - Final Design Approval	06/15/1989	10/26/1990	356
16	ABS - Detail Plan Review	06/15/1989	06/30/1989	11
42	----------	08/30/1989	09/14/1989	11

Activity: #41 Mech & Elect Det'l Design Date: 01/22/1987

Early Start: 02/09/1989 Early Finish: 08/16/1989
Late Start : 03/10/1989 Late Finish : 09/14/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
25	Module Connection Design	12/27/1988	02/23/1989	42
34	Final Process & Inst Diag	01/04/1989	02/23/1989	36
38	Prep Piping Isometrics	02/08/1989	02/23/1989	11
39	Module Concept Development	10/05/1988	02/23/1989	101

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
42	----------4	08/30/1989	09/14/1989	11

Activity: #42 ----------4 Date: 01/22/1987

Early Start: 08/30/1989 Early Finish: 08/30/1989
Late Start : 09/14/1989 Late Finish : 09/14/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
35	Instrumentation Det'l Design	08/30/1989	09/14/1989	11
40	Module Struct Design	06/14/1989	06/29/1989	11
41	Mech & Elect Det'l Design	08/16/1989	09/14/1989	21

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
10	USCG - Certificates	09/01/1989	11/03/1989	45
13	MMS - Final Permit Review	09/01/1989	10/26/1990	300
50	Module Contr. Bid / Select	08/31/1989	09/15/1989	11

Activity: #43 PROCUREMENT - PROCESS Date: 01/22/1987

Early Start: 07/01/1987 Early Finish: 07/01/1987
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
	NONE			

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			

Activity: #44 Major Eqpt Inquiry & Bid Date: 01/22/1987

Early Start: 04/28/1988 Early Finish: 07/25/1988
Late Start : 06/21/1988 Late Finish : 09/15/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
32	Dev Major Equip Specs	04/27/1988	05/12/1988	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
45	Maj Eqpt Ordering	07/26/1988	09/16/1988	38
48	----------	502/05/1990	09/30/1991	430

Activity: #45 Maj Eqpt Ordering Date: 01/22/1987

Early Start: 07/26/1988 Early Finish: 08/22/1988
Late Start : 09/16/1988 Late Finish : 10/13/1988

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
44	Major Eqpt Inquiry & Bid	07/25/1988	09/15/1988	38

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
34	Final Process & Inst Diag	08/25/1988	10/14/1988	36
46	Maj Eqpt Fabrication -- Vendor	08/23/1988	12/23/1988	88
48	----------	502/05/1990	09/30/1991	430

Activity: #46 Maj Eqpt Fabrication -- Vendor Date: 01/22/1987

Early Start: 08/23/1988 Early Finish: 02/05/1990
Late Start : 12/23/1988 Late Finish : 06/07/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
45	Maj Eqpt Ordering	08/22/1988	10/13/1988	38

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
48	----------	502/05/1990	09/30/19	430
53	Final Module Fabrication	05/24/1990	06/08/19	11

Activity: #47 Bulk Mat'ls Procurement Date: 01/22/1987

Early Start: 06/15/1989 Early Finish: 12/20/1989
Late Start : 08/04/1989 Late Finish : 02/08/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
38	Prep Piping Isometrics	02/08/1989	02/23/1989	11
40	Module Struct Design	06/14/1989	06/29/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
48	----------5	02/05/1990	09/30/1991	430
52	Initial Module Fabrication	01/25/1990	02/09/1990	11

Activity: #48 ----------5 Date: 01/22/1987

Early Start: 02/05/1990 Early Finish: 02/05/1990
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
44	Major Eqpt Inquiry & Bid	07/25/1988	09/15/1988	38
45	Maj Eqpt Ordering	08/22/1988	10/13/1988	38
46	Maj Eqpt Fabrication -- Vendor	02/05/1990	06/07/1990	88
47	Bulk Mat'ls Procurement	12/20/1989	02/08/1990	36

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			

Activity: #49 PROCESS MODULE CONSTRUCTION Date: 01/22/1987

Early Start: 07/01/1987 Early Finish: 07/01/1987
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
	NONE			

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			

Activity: #50 Module Contr. Bid / Select Date: 01/22/1987

Early Start: 08/31/1989 Early Finish: 11/27/1989
Late Start : 09/15/1989 Late Finish : 12/12/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
42	----------408	08/30/1989	09/14/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
51	Mod P -Const Prep	11/28/1989	12/13/1989	11
54	----------611	11/07/1990	11/22/1990	11

Activity: #51 Mod Pre-Const Prep Date: 01/22/1987

Early Start: 11/28/1989 Early Finish: 01/24/1990
Late Start : 12/13/1989 Late Finish : 02/08/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
50	Module Contr. Bid / Select	11/27/1989	12/12/1989	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
52	Initial Module Fabrication	01/25/1990	02/09/1990	11
54	----------6	11/07/1990	11/22/1990	11

Activity: #52 Initial Module Fabrication Date: 01/22/1987

Early Start: 01/25/1990 Early Finish: 05/23/1990
Late Start : 02/09/1990 Late Finish : 06/07/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
47	Bulk Mat'ls Procurement	12/20/1989	02/08/1990	36
51	Mod Pre-Const Prep	01/24/1990	02/08/1990	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
53	Final Module Fabrication	05/24/1990	06/08/1990	11
54	----------6	11/07/1990	11/22/1990	11

Activity: #53 Final Module Fabrication Date: 01/22/1987

Early Start: 05/24/1990 Early Finish: 11/07/1990
Late Start : 06/08/1990 Late Finish : 11/22/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
46	Maj Eqpt Fabrication -- Vendor	02/05/1990	06/07/1990	88
52	Initial Module Fabrication	05/23/1990	06/07/1990	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
54	----------6	11/07/1990	11/22/1990	11

Activity: #54 ----------6 Date: 01/22/1987

Early Start: 11/07/1990 Early Finish: 11/07/1990
Late Start : 11/22/1990 Late Finish : 11/22/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
50	Module Contr. Bid / Select	11/27/1989	12/12/1989	11
51	Mod Pre-Const Prep	01/24/1990	02/08/1990	11
52	Initial Module Fabrication	05/23/1990	06/07/1990	11
53	Final Module Fabrication	11/07/1990	11/22/1990	11

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
65	VESSEL COMPLETION	11/22/1990	09/30/1991	222
66	Module Installation	11/23/1990	11/23/1990	0

Activity: #55 VESSEL CONSTRUCTION Date: 01/22/1987

Early Start: 07/01/1987 Early Finish: 07/01/1987
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
	NONE			

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			

CRITICAL

Activity: #56 Vessel Const. Contract Nego. Date: 01/22/1987

Early Start: 04/12/1989 Early Finish: 05/09/1989
Late Start : 04/12/1989 Late Finish : 05/09/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
8	USCG - Basic Design Approval	12/14/1988	04/11/1989	84
15	ABS - Basic Design Review	04/11/1989	04/11/1989	0
12	MMS - Field Devel/Envir Assess	04/07/1989	04/11/1989	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
24	Vess Detailed Design	05/10/1989	05/10/1989	0
58	Vess Eqpt Procurement	09/01/1989	09/01/1989	0
64	----------	711/22/1990	09/30/1991	222

CRITICAL

Activity: #57 Vess Mat'l Procurement Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 11/23/1989
Late Start : 09/01/1989 Late Finish : 11/23/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
24	Vess Detailed Design	08/31/1989	08/31/1989	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
59	Hull Steelwork Fabrication	11/24/1989	11/24/1989	0
64	----------	11/22/1990	09/30/1991	222

CRITICAL

Activity: #58 Vess Eqpt Procurement Date: 01/22/1987

Early Start: 09/01/1989 Early Finish: 01/04/1990
Late Start : 09/01/1989 Late Finish : 01/04/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
56	Vessel Const. Contract Nego.	05/09/1989	05/09/1989	0
24	Vess Detailed Design	08/31/1989	08/31/1989	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
60	Mechanical Eqpt Installation	01/05/1990	01/05/1990	0
64	----------	11/22/1990	09/30/1991	222

CRITICAL

Activity: #59 Hull Steelwork Fabrication Date: 01/22/1987

Early Start: 11/24/1989 Early Finish: 03/29/1990
Late Start : 11/24/1989 Late Finish : 03/29/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
16	ABS - Detail Plan Review	11/08/1989	11/23/1989	11
57	Vess Mat'l Procurement	11/23/1989	11/23/1989	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
61	Hull Outfitting	03/30/1990	03/30/1990	0
64	----------711/22/1990		09/30/1991	222

CRITICAL

Activity: #60 Mechanical Eqpt Installation Date: 01/22/1987

Early Start: 01/05/1990 Early Finish: 03/29/1990
Late Start : 01/05/1990 Late Finish : 03/29/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
58	Vess Eqpt Procurement	01/04/1990	01/04/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
61	Hull Outfitting	03/30/1990	03/30/1990	0
64	----------711/22/1990		09/30/1991	222

CRITICAL

Activity: #61 Hull Outfitting Date: 01/22/1987

Early Start: 03/30/1990 Early Finish: 05/24/1990
Late Start : 03/30/1990 Late Finish : 05/24/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
59	Hull Steelwork Fabrication	03/29/1990	03/29/1990	0
60	Mechanical Eqpt Installation	03/29/1990	03/29/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	Mech Test, Prep for Tow	05/25/1990	05/25/1990	0
64	----------	711/22/1990	09/30/1991	222

CRITICAL

Activity: #62 Mech Test, Prep for Tow Date: 01/22/1987

Early Start: 05/25/1990 Early Finish: 07/12/1990
Late Start : 05/25/1990 Late Finish : 07/12/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
61	Hull Outfitting	05/24/1990	05/24/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
63	Tow Hull to Outfitting Site	07/13/1990	07/13/1990	0
64	----------	711/22/1990	09/30/1991	222

CRITICAL

Activity: #63 Tow Hull to Outfitting Site Date: 01/22/1987

Early Start: 07/13/1990 Early Finish: 11/22/1990
Late Start : 07/13/1990 Late Finish : 11/22/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
62	Mech Test, Prep for Tow	07/12/1990	07/12/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
64	----------7	11/22/1990	09/30/1991	222
66	Module Installation	11/23/1990	11/23/1990	0

Activity: #64 ----------7 Date: 01/22/1987

Early Start: 11/22/1990 Early Finish: 11/22/1990
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
56	Vessel Const. Contract Nego.	05/09/1989	05/09/1989	0
57	Vess Mat'l Procurement	11/23/1989	11/23/1989	0
58	Vess Eqpt Procurement	01/04/1990	01/04/1990	0
59	Hull Steelwork Fabrication	03/29/1990	03/29/1990	0
60	Mechanical Eqpt Installation	03/29/1990	03/29/1990	0
61	Hull Outfitting	05/24/1990	05/24/1990	0
62	Mech Test, Prep for Tow	07/12/1990	07/12/1990	0
63	Tow Hull to Outfitting Site	11/22/1990	11/22/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL

Activity: #65 VESSEL COMPLETION Date: 01/22/1987

Early Start: 11/22/1990 Early Finish: 11/22/1990
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
54	----------611	11/07/1990	11/22/1990	11
64	----------711	11/22/1990	09/30/1991	222

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
NONE				

CRITICAL

Activity: #66 Module Installation Date: 01/22/1987

Early Start: 11/23/1990 Early Finish: 01/10/1991
Late Start : 11/23/1990 Late Finish : 01/10/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
54	----------611	11/07/1990	11/22/1990	11
63	Tow Hull to Outfitting Site	11/22/1990	11/22/1990	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
67	Module Completion / Tie-in	01/11/1991	01/11/1991	0
68	Complete Vessel Outfitting	01/11/1991	01/11/1991	0
70	----------805	02/1991	05/02/1991	0

CRITICAL

Activity: #67 Module Completion / Tie-in Date: 01/22/1987

Early Start: 01/11/1991 Early Finish: 04/04/1991
Late Start : 01/11/1991 Late Finish : 04/04/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
66	Module Installation	01/10/1991	01/10/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
69	Dockside Trials and Tests	04/05/1991	04/05/1991	0
70	----------	805/02/1991	05/02/1991	0

CRITICAL

Activity: #68 Complete Vessel Outfitting Date: 01/22/1987

Early Start: 01/11/1991 Early Finish: 04/04/1991
Late Start : 01/11/1991 Late Finish : 04/04/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
66	Module Installation	01/10/1991	01/10/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
69	Dockside Trials and Tests	04/05/1991	04/05/1991	0
70	----------	805/02/1991	05/02/1991	0

CRITICAL

Activity: #69 Dockside Trials and Tests Date: 01/22/1987

Early Start: 04/05/1991 Early Finish: 05/02/1991
Late Start : 04/05/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
67	Module Completion / Tie-in	04/04/1991	04/04/1991	0
68	Complete Vessel Outfitting	04/04/1991	04/04/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
70	----------805	05/02/1991	05/02/1991	0

CRITICAL

Activity: #70 ----------8 Date: 01/22/1987

Early Start: 05/02/1991 Early Finish: 05/02/1991
Late Start : 05/02/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
66	Module Installation	01/10/1991	01/10/1991	0
67	Module Completion / Tie-in	04/04/1991	04/04/1991	0
68	Complete Vessel Outfitting	04/04/1991	04/04/1991	0
69	Dockside Trials and Tests	05/02/1991	05/02/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
78	DEPLOYMENT AND START-UP	05/02/1991	05/02/1991	0

Activity: #71 GAS FIELD DEVELOPMENT Date: 01/22/1987

Early Start: 04/07/1989 Early Finish: 04/07/1989
Late Start : 08/03/1989 Late Finish : 08/03/1989

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
12	MMS - Field Devel/Envir Assess	04/07/1989	04/11/1989	2
26	Prep Field Development Plan	10/14/1988	10/18/1988	2

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
72	Procure Subsea, Flow. & Riser	05/17/1989	08/04/1989	57
73	Drill & Test Production Wells	11/22/1989	02/09/1990	57
74	Procure Moor, Riser & Flowline	04/10/1989	07/06/1990	324

Activity: #72 Procure Subsea, Flow. & Riser Date: 01/22/1987

Early Start: 05/17/1989 Early Finish: 11/21/1989
Late Start : 08/04/1989 Late Finish : 02/08/1990

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
27	Specify Subsea and Well Eqpt	05/16/1989	08/03/1989	57
71	GAS FIELD DEVELOPMENT	04/07/1989	08/03/1989	84

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
73	Drill & Test Production Wells	11/22/1989	02/09/1990	57
76	Install Flowlines & Risers	12/19/1990	03/08/1991	57
77	----------	902/12/1991	05/02/1991	57

Activity: #73 Drill & Test Production Wells Date: 01/22/1987

Early Start: 11/22/1989 Early Finish: 10/23/1990
Late Start : 02/09/1990 Late Finish : 01/10/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
71	GAS FIELD DEVELOPMENT	04/07/1989	08/03/1989	84
72	Procure Subsea, Flow. & Riser	11/21/1989	02/08/1990	57

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
75	Install Moorings	10/24/1990	01/11/1991	57
77	----------	902/12/1991	05/02/1991	57

Activity: #74 Procure Moor, Riser & Flowline Date: 01/22/1987

Early Start: 04/10/1989 Early Finish: 10/13/1989
Late Start : 07/06/1990 Late Finish : 01/10/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
12	MMS - Field Devel/Envir Assess	04/07/1989	04/11/1989	2
28	Mooring and Riser Sys Design	02/14/1989	05/04/1989	57
71	GAS FIELD DEVELOPMENT	04/07/1989	08/03/1989	84

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
75	Install Moorings	10/24/1990	01/11/1991	57
76	Install Flowlines & Risers	12/19/1990	03/08/1991	57

Activity: #75 Install Moorings Date: 01/22/1987

Early Start: 10/24/1990 Early Finish: 12/18/1990
Late Start : 01/11/1991 Late Finish : 03/07/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
73	Drill & Test Production Wells	10/23/1990	01/10/1991	57
74	Procure Moor, Riser & Flowline	10/13/1989	01/10/1991	324

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
76	Install Flowlines & Risers	12/19/1990	03/08/1991	57
77	----------	902/12/1991	05/02/1991	57

Activity: #76 Install Flowlines & Risers Date: 01/22/1987

Early Start: 12/19/1990 Early Finish: 02/12/1991
Late Start : 03/08/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
72	Procure Subsea, Flow. & Riser	11/21/1989	02/08/1990	57
74	Procure Moor, Riser & Flowline	10/13/1989	01/10/1991	324
75	Install Moorings	12/18/1990	03/07/1991	57

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
77	----------	902/12/1991	05/02/1991	57

Activity: #77 ----------9 Date: 01/22/1987

Early Start: 02/12/1991 Early Finish: 02/12/1991
Late Start : 05/02/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
73	Drill & Test Production Wells	10/23/1990	01/10/1991	57
72	Procure Subsea, Flow. & Riser	11/21/1989	02/08/1990	57
75	Install Moorings	12/18/1990	03/07/1991	57
76	Install Flowlines & Risers	02/12/1991	05/02/1991	57

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
78	DEPLOYMENT AND START-UP	05/02/1991	05/02/1991	0

CRITICAL

Activity: #78 DEPLOYMENT AND START-UP Date: 01/22/1987

Early Start: 05/02/1991 Early Finish: 05/02/1991
Late Start : 05/02/1991 Late Finish : 05/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
19	----------2	02/28/1991	05/02/1991	45
70	----------8	05/02/1991	05/02/1991	0
77	----------9	02/12/1991	05/02/1991	57

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
79	Move Plantvessel to Site	05/03/1991	05/03/1991	0

CRITICAL

Activity: #79 Move Plantvessel to Site Date: 01/22/1987

Early Start: 05/03/1991 Early Finish: 05/20/1991
Late Start : 05/03/1991 Late Finish : 05/20/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
78	DEPLOYMENT AND START-UP	05/02/1991	05/02/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
80	Mooring and Riser Hook-up	05/21/1991	05/21/1991	0
83	----------	1009/30/1991	09/30/1991	0

CRITICAL

Activity: #80 Mooring and Riser Hook-up Date: 01/22/1987

Early Start: 05/21/1991 Early Finish: 06/17/1991
Late Start : 05/21/1991 Late Finish : 06/17/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
79	Move Plantvessel to Site	05/20/1991	05/20/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
81	Plant Testing & Commissioning	06/18/1991	06/18/1991	0
83	----------	1009/30/1991	09/30/1991	0

CRITICAL

Activity: #81 Plant Testing & Commissioning Date: 01/22/1987

Early Start: 06/18/1991 Early Finish: 09/02/1991
Late Start : 06/18/1991 Late Finish : 09/02/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
80	Mooring and Riser Hook-up	06/17/1991	06/17/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
82	Start-up Operations	09/03/1991	09/03/1991	0
83	----------	1009/30/1991	09/30/1991	0

CRITICAL

Activity: #82 Start-up Operations Date: 01/22/1987

Early Start: 09/03/1991 Early Finish: 09/30/1991
Late Start : 09/03/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
81	Plant Testing & Commissioning	09/02/1991	09/02/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
83	----------	1009/30/1991	09/30/1991	0

CRITICAL

Activity: #83 ----------10 Date: 01/22/1987

Early Start: 09/30/1991 Early Finish: 09/30/1991
Late Start : 09/30/1991 Late Finish : 09/30/1991

Resources Allocated:

Name	Duration (Days)	Amount used	Cost	Cost Basis	Cost to Complete
Total					$0.00

Predecessors:

#	Activity:	EARLY FINISH	LATE FINISH	SLACK AVAIL
79	Move Plantvessel to Site	05/20/1991	05/20/1991	0
80	Mooring and Riser Hook-up	06/17/1991	06/17/1991	0
81	Plant Testing & Commissioning	09/02/1991	09/02/1991	0
82	Start-up Operations	09/30/1991	09/30/1991	0

Successors:

#	Activity:	EARLY START	LATE START	SLACK AVAIL
	NONE			