

GEORGIA INSTITUTE OF TECHNOLOGY

OFFICE OF RESEARCH ADMINISTRATION

Date: November 4, 1970

RESEARCH PROJECT INITIATION

Project Title: Scientific Services

Project No.: B-627

Project Director: Dr. M. R. Carstens

Sponsor: Transcontinental Gas Pipe Line Corporation

Agreement Period: From October 26, 1970 until approximately January 31, 1971

Type Agreement: Purchase Order No 331,294

Amount: Not to exceed \$6,000.00\*

\* Will be reduced by the amount of any materials which Sponsor elects to furnish.

REPORTS REQUIRED: As necessary

SPONSOR CONTACT PERSONS: Technical Matters

Mr. Donn W. Leva  
Transcontinental Gas Pipe Line Corporation  
P.O. Box 1396  
Houston, Texas 77001

Contractual Matters

Mr. Roland E. Sledge  
Director of Purchasing  
Transcontinental Gas Pipe Line Corporation  
P.O. Box 1396  
Houston, Texas 77001

Assigned to: School of Civil Engineering

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- ☐ EES Machine Shop
- ☐ EES Accounting Office

Other File B-627

GEORGIA INSTITUTE OF TECHNOLOGY

OFFICE OF RESEARCH ADMINISTRATION

RESEARCH PROJECT TERMINATION

Date: August 3, 1971

Project Title: Scientific Services

Project No: E-20-614

Principal Investigator: Dr. M. R. Carstens

Sponsor: Transcontinental Gas Pipe Line Corporation

Effective Termination Date: July 18, 1971\*

Clearance of Accounting Charges: July 31, 1971\*\*

Grant/Contract Closeout Actions Remaining: Final Invoices (2).

\* Work to be continued effective 19 July 71 (under Research Project No. E-20-618) based on Sponsor's new Purchase Order No. 341,417.

\*\* Or possibly later, but Final Invoices (2) to be submitted Immediately in accordance with Sponsor's special instructions.

Assigned to: School of Civil Engineering

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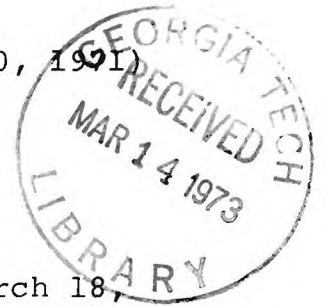
Library, Technical Reports Section ✓

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Project Files E-20-614 (B-627)

Other \_\_\_\_\_



Progress Report of Project B-627 (March 15 through May 10, 1971)

From: M. R. Carstens, Project Director

To: Transcontinental Gas Pipe Line Company, Houston  
Attention: Mr. Donn Leva

Refer To: Section A of Proposal submitted to Transco March 18, 1971, for work accomplished prior to March 15, 1971

A. Work accomplished in the period March 15 - May 10:

1. The translation of a computer program for the unsteady-state analysis of a segment of a capsule-transport pipeline has been completed. This program in FORTRAN IV has been checked and duplicated. Two decks of punched cards upon which the program is inscribed have been delivered to Mr. Freeze. One deck is to be used only if the cross section of the pipeline is circular and the other deck can be used for pipelines of any cross sectional shape.

2. Designs for a complete terminal and a reversing terminal have been nearly completed. While these units were designed specifically for the Stockbridge Test Facility, units of similar configuration could be utilized on commercial pipelines. Units have been designed for (a) air bypass, (b) vehicle stopping and reversing, (c) vehicle unloading, (d) vehicle parking and loading, and (e) vehicle injection back into the pipeline. The designs have been complete enough in structural detail for fabrication by Transco's work forces. Engineering sketches, which are being used as working drawings, have been transferred to Mr. Freeze. The design of the reversing terminal is complete.



The design of the complete terminal is complete except for the control system.

3. Inasmuch as the control system must control and perform numerous operations in sequence with a high degree of reliability and safety, this part of the design was requested from engineers of the Mechanical Sciences Section of the Engineering Experiment Station who are experienced in control-system design. These engineers, Messrs. Kinney and Akridge, were requested to design the control system for the reversing terminal first. The design of the control system and the bill of materials for the control system of the reversing terminal have been transmitted to Mr. Freeze. The design and specification of components of the control system for the complete terminal are about 75 percent complete. The car retaining devices were designed by Mr. Akridge to be compatible with the power units which he specified. In addition Mr. Akridge is supervising fabrication of the car retainers in the shop of the EES. Car retainers for the reversing terminal have been fabricated.

4. Three nozzles for 3 additional pumps have been fabricated in the Hydraulics Laboratory shop by Mr. Bates. These units are now ready for installation on the Stockbridge Test Facility.

5. All of the wood portions of six vehicles have been cutout in the Hydraulics Lab shop by Mr. Bates. As of this date he is gluing the boxes together in preparation for shipping

the boxes and the end plates to a commercial shop where a glass-fiber-reinforced layer of resin will be sprayed on all exposed surfaces of the boxes and end plates.

6. Thirty-six wheel mounts (six for each car) have been fabricated in the shop of the Engineering Experiment Station from a model prepared by Mr. Bates.

7. A heavy-paper template was made for circular-arc cuts in the 36-in pipe of the reversing unit. Heavy-paper templates were made for the miter-bend piece of the reversing unit of the complete terminal. These templates have been transferred to Mr. Freeze for use in fabricating the Stockbridge Test Facility. A heavy-paper template has been prepared for the pipe cutouts of the pumps.

8. A conceptual model of a complete terminal was constructed by Mr. Bates in order to obtain Transco's approval before undertaking the specific design described in A.2 above.

B. Work remaining to be completed for Stockbridge Test Facility:

1. Completion of work described in A.3 above.

2. Upon return of the vehicle bodies and endplates with the glass-fiber reinforced layers the following work is to be done:

a. Drill the end plates for wheel mounting brackets and mount the wheel brackets.

b. Paint end plates blue.

c. Paint the boxes white.

d. Drill end plates and boxes for vibration isolators and mount vibration isolators.

e. Fabricate and mount bumpers on the end plates. Various available materials for the bumpers are being investigated. As of this date the best available material appears to be a foamed polyvinyl plastic used for padding athletic uniforms. Unfortunately the maximum thickness of the sheets is 1-inch which will require cementing five sheets together prior to cutting out the bumpers and cementing to the end plates.

f. Fasten flexible annulus to end plates.

g. Assemble six vehicles.


3. Assemble the pumps including fabrication of the pump housing.

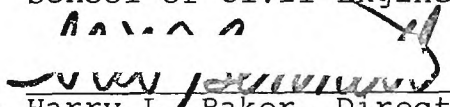
4. Design and fabricate an instrument car for the determination of displacement-time records. The existing system of using a fish line tied to a vehicle with a stationary recording system will not work in the expanded system at Stockbridge. Dr. Carstens believes that an in-depth analysis of the operating characteristics of Stockbridge Test Facility will involve comparison of measured trajectory with computed trajectory (See A.1).

Respectfully submitted,

M. R. Carstens  
Project Director

Approved:

  
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W. M. Sangster, Director  
School of Civil Engineering

  
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Harry L. Baker, Director  
Research Administration