MP 608 – Marshall, Michigan Incident
NTSB/PHMSA Information Request No. 81

81 **Reference:** Email request by Matt Nicholson on October 1, 2010

Preamble:

Request: Please provide any Moody Inspection report for the Italsider pipe (L63-3592).

Required by: October 14th, 2010

Response: Attachments:

- Inspection Report.pdf
- Letter.pdf
- Moody Insp.pdf

INTERPROVINCIAL PIPE LINE COMPANY

copy also on 1046.2.4

E - 275

December 17, 1969

Siderius Inc.
745 5th Avenue
New York, N.Y. 10022

Attention: F. Palazzuoli/A. Concina

Gentlemen:

Siderius recently completed delivery of 190 miles of 30" O.D. by 0.250" wall 5LX52 line pipe for our Lakehead Pipe Line project in the State of Michigan. This 40,000 ton order was supplied by the Italsider mill in Taranto and delivered to field unloading points via truck from the port at Windsor, Ontario.

You will recall that we requested a visit by our technical and inspection personnel to your pipe mill and a prepurchase discussion with your mill and quality control personnel before placing our purchase order. At the prepurchase discussion we requested certain "aiming points" for both plate edge and inside-outside weld misalignment more stringent than required by A.P.I. Standard 5LX. We are pleased to advise that your mill people cooperated wholeheartedly with our mill inspection team in striving to meet our requested "aiming points".

We believe that as a result of these discussions and the fine cooperation on the part of the mill production people we obtained quality pipe with which we are very pleased. Our field inspection personnel as well as the construction contractor expressed satisfaction with the quality of the pipe delivered. The fact that the entire pipeline satisfactorily passed the hydrostatic test and as of today is in full service is ample evidence of our satisfaction.

We will be pleased to consider future proposals from Siderius for the supply of line pipe requirements for Lakehead or Interprovincial projects.

Yours very truly,

R. K. Heule

RKH/ven

bcc: W. A. Baltes
C. H. Bucklee
D. D. Burley

COPY

MOODY ENGINEERING C\ PANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Manufacturer Italsider 1691.0088.
Taranto, Italy.

Item No. 1.

Drawings :---

Specification API Standard 5LX & Client's Requirements.

Progress Report #13.

Accepted and released for shipment on: From September 6th, through September 10th, 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.---982,080'---30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees angle plus five degrees, minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---23,864 Pieces.---928,532'--0".

Present Inspection, OK:--- 2,018 Pieces.--- 77,937'--0".

Totals: 25,882 Pieces.---1,006,469'--0".

Average Overall length: 38.88"

In summary, your subject order is now completed in its entirety. Final report will be forwarded promptly upon receipt pertinent data from mill

Our inspector in charge of boatloading has advised that loading of the last boat the Pacific Skou will not begin until Monday September 15, 1969 as the boat will not arrive until sometime on Sunday September 14, 1969.

CLB

Enclosures:

For attention:

Sincerely,

Name of Inspector:

David Erlwein.

Date 9-11.

Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company.
cc: Mr. Herbert F. Brown, Metallurgical Consultant.

16.12.7

MOODY ENGINEERING CO ANY
227 FRIENDSHIP PLAZA BUILDING
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PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.
Item No. 1.

Manufacturer Italsider1691.0088.
Taranto, Italy.

Drawings: ----

Progress Report #12.

Specification API Std. 5LX & Client's Requirements.

Accepted and released for shipment on: From ~~September 3rd 11:00 PM until Saturday 7:00 AM September 6th 1969.~~ Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.----982,080'----30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---22,725 Pieces.---883,359'--0".

Present Inspection, OK:--- 1,139 Pieces.--- 45,173'--0".

Totals: 23,864 Pieces.---928,532'--0".

Average Overall length: 38.90".

Please be further advised. The Italsider mill expects to complete your order on 9-11-69. From the looks of things provided no further down time relative their Expander we should complete your subject order sometime during morning of September 10th, 1969.

In summary your present run is progressing normally. We shall continue to keep you advised.

Enclosures:

For attention:

Sincerely,
Name of Inspector
David Erlwein.

Date: 9-6-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline

16.12.1

MOODY ENGINEERING CO. ANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Manufacturer Italsider, 1691.0088
Taranto, Italy.

Item No. 1.

Drawings: ----

Progress Report #11.

Specification API 5LX, Client's Requirements.

Accepted and released for shipment on: ~~August 29th through~~ 2:00 PM September 3, 1969.

Rejected on:

Held in abeyance on: ---

Summary:

Item 1.----982,080'----30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

Report:

Previous Inspection OK:---20,471 Pieces.---796,658'--0"

Present Inspection, OK:--- 2,254 Pieces.--- 86,701'--0"

Totals: 22,725 Pieces.---883,359'--0"

Average Overall length: 38.87"

The Italsider mill expects to complete your subject order on or about September 11th, 1969.

In summary, we shall continue to keep you advised.

ROUTE	CONSULT	REPLY	CHECK & RETURN	INFORMATION
RHC				
CHB				
CLB				Comments
WMP				
JRW				
NGT				
RND				
WRW				
C				

Enclosures:

For attention:

Sincerely,

Name of Inspector David Erlwein.

Date: 9-4-69.

Signature D Erlwein.

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.

16.12.4

MOODY ENGINEERING CO ANY
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5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company I63-3592.

Item No. 1.

Manufacturer Italsider 1691.0088 Taranto, Italy.

Drawings: ----

Progress Report #10.

Specification API Std. 5LX & Client Requirements.

Accepted and released for shipment on: From August 18, 1969 thru 7:00AM August 21, 1969.

Rejected on: ----

Held in abeyance on: ----

Summary:

Item.1.--30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

Report:

Previous Inspection OK:---19,227 Pieces.---748,183'--6".

Present Inspection, OK:--- 1,244 Pieces.--- 48,474'--6".

Totals: 20,471 Pieces.---796,658'--0". Average length 38.91"

The Italsider mill is again scheduled to start up between August 28th and 30th 196
We shall continue to keep you advised.

	ROUTE	CONSULT	REPLY	CHECK & RETURN	INFORMATION
RHC					
CHB					
GLB					
WMP					
JRW					
NGT					
RND					
WHW					
CRV					

Enclosures:

For attention:

Sincerely,
Name of inspector
David Erlwein.

Date 8-22-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company.

MOODY ENGINEERING COM NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

16-12-7

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592

Item No. 1

Manufacturer: Italsider 1691.00 Taranto, Italy.

Drawings: ----

Specification: API Std. & Client' Requirements.

PROGRESS REPORT #2.

Accepted and released for shipment on: ---- Rejected on: ---- Held in abeyance on: ----

Summary: From 7:00 AM August 15th through 7:00 AM August 17, 1969.

Item 1.----983,080'-----30" x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32, for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

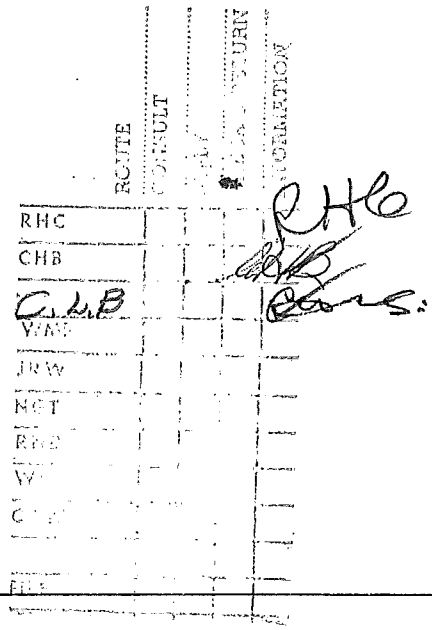
Report:

Previous Inspection OK:---17,870 Pieces---695,382'--6".

Present Inspection, OK:--- 1,357 Pieces--- 52,801'--0".

Totals: 19,227 Pieces---748,183'--6".

In summary, we shall continue to keep you advised.



Enclosures:

For attention:

Sincerely,
Name of inspector

David Erlwein.

Date: 8-17-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company

MOODY ENGINEERING COM NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592

Manufacturer Italsider 1691.0088 Taranto, Italy.

Item No. 1.

Drawings: ----

Specification API Std 5LX & Client's Requirements.

PROGRESS REPORT #8.

Accepted and released for shipment on: From August 11th through 7:00 AM August 15th, 1969. 24 hour strike on August 13, 1969.

Rejected on: ----

Held in abeyance on: ----

Item 1.----982,080'----30" DD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Std 5LX Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---16,513 Pieces---642,537'--6"

Present Inspection, OK:--- 1,357 Pieces--- 52,845'--0"

Totals: 17,870 Pieces---695,382'--6"

Average overall length: 38.91"

The Essex Trader loading was completed On August 12, 1969 with a total number of loaded pieces of 3,022.

The Himmerland is expected to arrive at the Taranto port on Monday August 18, 1969 when loading will be resumed.

Our Pittsburgh Office, and Mr. Herbert F. Brown, have been advised by cable for transmittal to you that the Italsider mill will stop production of your order either on August 20 or 21, 1969 for a period of a week to ten days after which will resume production of your order.

In summary, we shall continue to keep you advised.

ROUTE | ACQUIT | SIGNATURE

RHC
CHB
E.L.B
WMP
JRW
GT
WND
WNW
CRW
FILE

Enclosures:

For attention:

Sincerely,
Name of inspector

Date: 8-15-69.
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592 Manufacturer: Italsider
Item No. 1. 1691.0088
Taranto, Italy.

Drawings: ----

PROGRESS REPORT #7. Specification: API Std. 5LX, Latest Edit. & Client's Req.

Accepted and released for shipment on: ~~XX From~~ 11:00 AM August 8th until ~~August 10th, 1969 7:00AM.~~ Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.----982,080'----30" x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32" for welding to API Standard 5LX, Latest Edition, and to Client's Requirements

Report:

Previous Inspection OK:---15,218 Pieces---592,077'--6".

Present Inspection, OK:--- 1,295 Pieces--- 50,460'--0"

Totals: 16,513 Pieces---642,537'--6"

Average overall length: 38.91"

Please find attached herewith for your review Ladle Analyses, Mill Control Check Analyses, Declaration of Quality, Circumference before and after expansion and percent of expansion, also copy of Burst Test conducted last week on selection of one pipe out of first hundred inspected.

Loaded on Essex Trader, until Sunday morning 8-10-68-2550. Pieces. Estimated completion and clearing 8-12-69.

Pipe quality and production at the moment is satisfactory. If there is any drastic change in the present situation you will be advised immediately by cable.

Enclosures:

For attention:

Name of inspector: Sincerely, David Erlwein.

Date: 8-10-69

Signature: DE

cc: Mr. Roger Clute, Interprovincial Pipeline Company
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company
cc: Mr. Herbert F. Brown, Metallurgical Consultant

16.12.9

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA. 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Item No. 1.

Manufacturer: Italsider, 1691 Taranto, Italy

Drawings: ----

Specification: API Standard 5LX Latest Edition & Client's Require

Accepted and released for shipment on: From August 2 through 8th--11:00 AM.

Rejected on: ---

Held in abeyance on: ---

Summary:

Report:

Item 1.---982,080'---30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random length ends bevelled 30 degrees, angle plus 5 degrees minus zero width of flat 1/16" plus or minus 1/32" for welding to API Standard 5LX, Latest Edition, and to Client's Requirement

Previous Inspection OK:----13,232 Pieces----514,999'--6".
Present Inspection, OK:---- 1986 Pieces---- 77,078'--0".
Totals: 15218 Pieces----592,077'--6".

The Italsider mill's target date for completion is 8-26-6 It is felt by Mr. Herbert F. Brown, and the writer that u existing circumstances the completion date will actually or about August 30th, 1969.

The foregoing is based on the considerable downtime we ar presently experiencing with the Expander. All features on production line are being closely followed by Moody Perso If we run into any particular difficulty which will effec completion as stated in foregoing will cable immediately. The present run is proceeding satisfactorily, and we are endeavoring to improve quality even more than present mat being offered for our inspection.

In summary, we shall continue to keep you advised.

Enclosures:

For attention:

Name of inspector: Sincerely,
David Erlwein.

Date: 8-8-6

Signature: D Erlwein

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. R. Sorensen, Lakehead Pipeline Company

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

16-1-1 HHB
C.L.B.

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Item No. 1 & 2.

Manufacturer Italsider
1691.0088
Taranto, Italy.

Drawings :----

Progress Report #5.

Specification API Std. 5L & 5LX
Latest Edition &
Client's Requirements.

Accepted and released for shipment on: From February 13th through February 19th 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be API Std. 5LX, latest edition, and to client's requirements. Angle plus 5 degrees minus zero.

Report:

Previous Inspection OK.---11,087 Pieces.---432,263'
Present Inspection, OK.--- 2,145 Pieces.--- 82,736'-6"
Totals.----13,232 Pieces.---514,999'--6"

Item not complete. Balance of subject item as per the Italsider mill will be offered sometime between April 22 and 30th, 1969.

Item 2. 5,280'---30" x .500" wall x 157.53# API Grade B. submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 30 degrees for welding to be furnished to API Std. 5L, Latest edition and to client's requirements. Bevel angle 5 degrees plus minus zero.

Previous Inspection OK.---133 Pieces.---5,183'
Present Inspection, OK.--- 7 Pieces.--- 226'-6"

Totals.----140 Pieces.---5409'-6"

Item complete. Please note this 109'-6" over specified footage is subject to your approval, and the mill has been advised accordingly.

The mill has advised the writer that the tenative shipping date at the moment, will be between March 31st and April 15th 1969. Mr. H. F. Brown, during his visit was asked by the writer if you would want us to witness boat loading operation for proper loading and for damage at the port in Taranto, Italy? Therefore the writer would appreciate hearing from you, at your convenience relative your wishes concerning this matter so that proper provision can be made to handle this assignment promptly if you decide same is necessary?

Enclosures:

For attention:

Sincerely,
Name of inspector: David Erlwein.

Date 2-20-69.
Signature
D Erlwein

cc: Mr. R. Sorensen, Lakehead Pipeline Company.

16.14.1

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
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PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-35-92.

Item No. 1

Manufacturer: Italsider
1691.0088
Taranto, Italy.

Drawings: ----

Progress Report #4.

Specification: API Std. 5LX Latest Edition & Client's Requirements.

Accepted and released for shipment on: From February 7th through February 12, 1969.

Rejected on: ----

Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" Wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be to API Std. 5LX, latest edition, and to client's requirements.

Report:

Previous Inspection OK---8,141 Pieces---317,326'
Previous Inspection OK---2,946 Pieces---114,937'
Present

Totals--11,097 " "---432,263'

Balance of present run is expected to be completed on or about February 18, 1969.

The mill has presently advised that our second run of material shall commence on April 22, 1969 and be completed on or about May 22, 1969.

In summary, we shall continue to keep you advised.

1" = 75' = 23 [illegible]

Enclosures:

C.L.B.

For attention:

Sincerely,

Inspector: David Erlwein.

Date: 2-7

Signature:

cc: Mr. R. Sorensen, Lakehead Pipeline Company
cc: Mr. Roger H. Clute, Interprovincial Pipeline Company

16.12.1

MOODY ENGINEERING COM..NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA. 15206 · U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.
Item No. 1.

Manufacturer: Italsider
1691.0088
Tarento, Italy.

Drawings: ----

PROGRESS REPORT 3.

Specification: API Std. 5LX Latest Edition, & Client's Requirements.

Accepted and released for shipment on: From January 30th through February 6th 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be API Std. 5LX, latest edition, and to client's requirements.

Report:

Previous Inspection OK---5,251 Pieces---204,758!
Present Inspection OK.---2,890 Pieces---112,566!
Totals:--8,141 Pieces---317,326!

Please find attached herewith for your review Ladle Analyses Mill Control Check Analyses.

The Italsider mill has now advised that we shall complete the present run of material on or about February 18, 1969. We are to again start the second run of material on or about March 29, 1969.

In summary, we shall continue to keep you advised.

112.5 / 6 = 18,700 ft/day

112.5 / 7 = 16,000 ft/day

Enclosures:

C.L.B.

Date: 2-7-69

For attention:

Name of inspector: David Erlwein.

Signature

cc: Mr. R. Sorensen, Lakehead Pipeline Company.
cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. H. E. Brown, Metallurgical Consultant.

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

ROUTE | CONSULT | REPLY | CHECK & RETURN | INFORMATION

RHC				
CHB				
CLB				
WMP				
JRW				
NGT				
RND				
WHW				
CRW				
FILE	16.12.7			

November 4, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. Walter A. Baltes, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #2

Gentlemen:

Referring to your purchase order #L63-3592, dated November 14, 1968, placed with Siderius, Inc., and covering as revised:

1,001,000 ft. of 30" O.D. x .250" wall x 79.43#/ft. API grade X52 submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5LX, latest edition.

5,280 ft. of 30" O.D. x .500" wall x 157.53#/ft. API grade B submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5L, latest edition.

we beg to report herewith on the inspection of all of the pipe furnished on the second and third runs.

The following material is covered by this report:

491,469.0 ft. of 30" O.D. x .250" wall API grade X52, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

This pipe was made at the Taranto, Italy plant of Italsider, where our inspection was conducted in compliance with your inspection order to us #L63-3897, dated January 6, 1969.

Specifications:

This pipe was manufactured and our inspection was conducted in accordance with API Std. 5LX, 16th Edition, dated April, 1969 for grade X52, submerged-arc welded, cold-expanded, basic-oxygen steel line pipe.

These specifications were supplemented per your Specification "Purchaser's Optional and Supplemental Requirements" attached to your purchase order.

Manufacture:

This pipe was made from steel plates. The plates as received from the plate mill have the edges prepared by trimming to the proper plate width by planing, at the same time slightly beveling the edges of the plate for welding. The plates are then formed into tubular shape by means of the standard crimping, U-ing and O-ing presses, forming the plate into cylindrical shape. Steel tabs are then welded on both ends of the can, in line with the open seam. Both the inside and outside welds start and stop on these tabs.

The inside weld bead is first deposited, starting and finishing the weld on the end tabs, and employing two weld headsin tandem. Both weld heads operate on alternating current. A flux back-up bar is used in making the inside weld, the pipe remaining stationary, the weld head traveling from the front end of the pipe to the back end of the pipe.

The outside weld bead is then deposited, also employing two welding heads in tandem. These two weld heads also operate on alternating current. The cylinder moves, with the welding head remaining stationary, the weld starting on the tab attached to one end of the pipe and finishing on the tab attached to the opposite end of the pipe. Good penetration is obtained between both outside and inside welds. The tabs are then removed from the ends of the pipe.

The cylinder, as formed and welded, is smaller in diameter than the specified nominal diameter of 30" O.D. The pipe is expanded to final diameter by hydraulic internal pressure while being held enclosed within a closed cylinder.

Our inspector-in-charge reports that the expanding pressure for this pipe was 1,050 psi. Diameter readings taken on a spot check basis throughout this run, before and after expansion, indicate that the pipe was expanded from .80% to 1.50%. The expansion was thus well below the 2.0% maximum expansion permitted by your specification.

The mill hydrostatic pressure test is applied to the pipe immediately following the expanding operation, and with the same equipment, but with the retaining dies released so that the pipe is not restricted during the mill hydrostatic test.

The pipe then proceeds to facing machined were both ends of the pipe are faced and beveled.

The ends of this pipe were beveled at an angle of 30° to the vertical, plus 5°, minus 0°, with an average width of root face at the ends of the pipe of 1/16", plus or minus 1/32".

The inside weld bead is then ground off flush with the internal surface of the pipe for a distance of approximately 2" from the ends.

Nondestructive Testing:

Prior to expansion, the longitudinal weld for it's full length (with the exception of a few inches at each end) is checked by means of ultrasonic equipment. The ultrasonic equipment is of Italian manufacture,

employing four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repair area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Test:

Each length of this pipe was subjected to a minimum hydrostatic pressure test of 780 psi, the full test pressure being maintained for a minimum period of ten seconds. While under the full pressure, the pipe was struck on or near the weld, with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consoling metallurgist. Mr. Brown did not return to the mill personally for the second and third runs of this pipe, as covered by this report. However, Mr. Brown was in constant communication by telephone and letter with our lead inspector at the mill, and assured himself that his instructions to us as set forth at the time that production of pipe on your order originally commenced early this year, were being fully followed and complied with.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked

with appropriate gages. In making this end inspection, our inspectors were particularly observant for any signs of laminations or other unsound material on the machined surface.

The outside diameter at each end of each length of pipe was checked by means of a slotted diameter tape, to insure that the minimum average diameter at the ends was not less than 29-31/32" nor more than 30-3/32".

On a spot check basis, but not less than three times per working turn, the outside diameter of the body of the pipe was checked by means of a diameter tape, to insure that the average diameter in the body was not less than 29-59/64" nor more than 30-7/32".

The ends of this pipe were continually checked throughout this inspection to insure that the out-of-roundness did not exceed plus or minus 1% of the nominal O.D. That is, to insure that the minor axis was not less than 29.7" and that the major axis was not greater than 30.3".

The wall thickness at each end of each length of pipe was checked by means of "go" and "no-go" gages to insure that the wall thickness at the ends was not less than 0.230" nor more than 0.299" (8% under and 19.5% over the nominal wall thickness of 0.250").

Periodically throughout this inspection, the squareness of the ends with respect to the longitudinal axis of the pipe, was checked, and held to a maximum deviateion of 1/16".

While making thesurface inspection, but particularly while the pipe was rotating, it was closely observed by our inspectors, to insure that it did not deviate in straightness more than 3/4" in 40 ft.

In making their surface inspection, any area that had been ground to remove a surface defect, was carefully examined by our inspectors to insure that the defect had first been completely removed, and secondly that the depth of grind did not encroach upon the minimum wall thickness tolerance.

We permitted no repair by welding either to the longitudinal weld, or to the body of the pipe itself, after the pipe had been expanded. There actually was very little repair by welding performed by the mill, and in such cases, the welding was made by personnel qualified under Appendix B of API Std. 5LX. These qualification records were examined by our lead inspector.

Chemical Analyses:

This pipe was produced from basic-oxygensteel plates. We are listing below the results of ladle analyses for each heat of steel used to produce all of the pipe as covered by this report, together with the results of check analyses made on drillings taken from at least one length of pipe produced from each heat. The results of these analyses are as follows:

The results of these four burst tests have been furnished to you by the mill, in booklet form. We have reviewed the results of these four burst tests, and judged them to be satisfactory. We therefore are not including in this inspection report any of the burst test data, as it would be redundant.

Preparation for Shipment:

All of this pipe was shipped bare, free of mill coating.

Our inspection mark "ME" was stenciled on the inside near one end of each length of pipe in line with the other mill markings.

The following marks were paint stenciled on the inside near one end of each length: "LAKEHEAD L63-3592 30" x .250" 79.43 X52 E BO 780 PSI". The API monogram, and the actual length in feet and decimals of a foot, and actual weight in pounds, of the individual length, were paint stenciled in line with these markings. At the opposite end of each length, the following markings were paint stenciled: "30" x .250" X52".

In addition, for identification purposes, two purple paint bands approximately 2" wide were painted around the outside near each end of each length.

All markings applied to this pipe during the manufacturing operation, were paint stenciled, no steel die-stamping being permitted.

The following quantities of pipe were accepted by us for shipment on this second and third production runs:

Pieces	Footage
12,650	491,469.5'

Our report #1, dated March 18, 1969, covered our inspection of the pipe furnished on the first production run on this order. The total quantities of pipe accepted by us for shipment on your order in toto, is as follows:

	Pieces	Footage
Report #1	13,232	514,999.50'
Report #2	12,650	491,469.50'
Total	25,882	1,006,469.00'

We did inspect a slight excess of pipe, in order that replacement pipe would be available for any damaged in transportation to the dock, or loading aboard vessel. The total quantities of pipe actually shipped against this order are as follows:

Pieces	Footage	Weight
30" O.D. x .250" Wall Pipe		
25,749	100,214.30'	80,947,194#
30" O.D. x .500" Wall Pipe		
140	5,407.20'	862,600#

The average length and weight per foot of the total quantities of pipe shipped, as reflected in the above figures, is as follows:

30" O.D. x .250" Wall Pipe

Average Length - 38'11- 3/64"
Average Wt./Ft. - 80.774# (approx. 1.69% over the nominal weight)

30" O.D. x .500" Wall Pipe

Average Length - 38' 7-15/32"
Average Wt./Ft. - 159.528# (approx. 1.26% over the nominal weight)

We had personnel stationed at the dock at the time of loading, supervising and inspecting the loading of this pipe, and the results of our loading inspection are covered by separate inspection report being rendered to you.

Conclusion:

In conclusion, we wish to state that the pipe furnished on this order received our careful inspection, and having been found to be satisfactory was accepted by us for shipment, subject to your shipping instructions.

Yours very truly,

MOODY ENGINEERING COMPANY

ORIGINAL SIGNED BY
PAUL A. MILLS

Paul A. Mills

PAM:ha

lcc: Mr. R. H. Clute
Interprovincial Pipe Line Company
Centennial Building
100 Street & 103 Avenue
Edmondton, Alberta, Canada

lcc: Mr. H. F. Brown
20 Ash Street
Basking Ridge, New Jersey

16.12.47

MOODY ENGINEERING COMPANY

227 FRIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

March 18, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. R. H. Sorenson, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #1

Gentlemen:

Referring to your purchase order #L63-3592, dated November 14, 1968, placed with Siderius, Inc., and covering:

982,080 ft. of 30" O.D. x .250" wall x 79.43#/ft. API grade X52 submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5LX, latest edition.

5,280 ft. of 30" O.D. x .500" wall x 157.53#/ft. API grade B submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5L, latest edition.

We beg to report herewith on the inspection of all of the pipe furnished on the first mill run.

The following material is covered by this report:

514,999.5 ft. of 30" O.D. x .250" wall API grade X52, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

5,409.5 ft. of 30" O.D. x .500" wall API grade B, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

NOTE: It will be noted that the second item was inspected with an overage of 129.5 ft. We are advised that the mill is seeking your approval to ship this small excess.

This pipe was made at the Taranto, Italy plant of Italsider, where our inspection was conducted in compliance with your inspection order to us #L63-3897, dated January 6, 1969.

Specifications:

This pipe was manufactured and our inspection was conducted in accordance with API Std. 5LX, 15th Edition, dated March, 1968 for grade X52, submerged-arc welded, cold-expanded, basic-oxygen steel line pipe (.250" wall pipe) and API Std. 5L, 23rd Edition, dated March, 1968 for grade B, submerged-arc welded, basic-oxygen steel line pipe (.500" wall pipe).

These specifications were supplemented per your Specification "Purchaser's Optional and Supplemental Requirements" attached to your purchase order.

Manufacture:

This pipe was made from steel plates. The plates as received from the plate mill have the edges prepared by trimming to the proper plate width by planing, at the same time slightly beveling the edges of the plate for welding. The plates are then formed into tubular shape by means of the standard crimping, U-ing and O-ing presses, forming the plate into cylindrical shape. Steel tabs are then welded on both ends of the can, in line with the open seam. Both the inside and outside welds start and stop on these tabs.

The inside weld bead is first deposited, starting and finishing the weld on the end tabs, and employing two weld heads in tandem. Both weld heads operate on alternating current. A flux back-up bar is used in making the inside weld, the pipe remaining stationary, the weld head traveling from the front end of the pipe to the back end of thepipe.

The outside weld bead is then deposited, also employing two welding heads in tandem. These two weld heads also operate on alternating current. The cylinder moves, with the welding head remaining stationary, the weld starting on the tab attached to oneend of the pipe and finishing on the tab attached to the opposite end of the pipe. Good penetration is obtained between both outside and inside welds. The tabs are then removed from the ends of the pipe.

The cylinder, as formed and welded, is smaller in diameter than the specified nominal diameter of 30" O.D. The pipe is expanded to final diameter by hydraulic internal pressure while being held enclosed within a closed cylinder.

Our inspector-in-charge reports that the expanding pressure for the .250" wall pipe was 1,050 psi, while the expanding pressure for the .500" wall pipe was 1,100 psi.

On approximately two lengths of pipe per turn, circumferential measurements were taken at eight places along the pipe length, these measurements being taken both before and after expansion. From these measurements, the percentage expansion on the .250" wall pipe ranged from .90% to 1.40% with the averagebeing approximately 1.25%. On the .500" wall pipe, the expansion figures ranged from .97% to 1.23%, with the average being approximately 1.05%.

It will be noted that the expansion on the .250" wall pipe was well below the 2.0% maximum as called for by your specification.

The mill hydrostatic pressure test is applied to the pipe immediately following the expanding operation, and with the same equipment, but with the retaining dies released so that the pipe is not restricted during the mill hydrostatic test.

The pipe then proceeds to facing machines were both ends of the pipe are faced and beveled.

Your original order called for this pipe to be beveled 37-1/2°, plus or minus 2-1/2°. The ends of this pipe were beveled in this manner up to approximately January 20, at which time we were advised of a change in your requirements, and the pipe was then beveled in the standard manner of 30° to the vertical, plus 5°, minus 0°. In all cases, the average width of root face at the ends of the pipe was 1/16", plus or minus 1/32".

The inside weld bead is then ground off flush with the internal surface of the pipe for a distance of approximately 2" from the ends.

Nondestructive Testing:

Prior to expansion, the longitudinal weld for it's full length (with the exception of a few inches at each end) is checked by means of ultrasonic equipment. The ultrasonic equipment is of Italian manufacture, employing four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repair area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Tests:

Each length of the .250" wall pipe was subjected to a minimum hydrostatic pressure test of 780 psi, while each length of .500" wall pipe was subjected to a minimum hydrostatic pressure test of 880 psi. It will be noted that the test pressure on the .500" wall item is the alternate test pressure for pipe of this size and grade, as called for by API Std. 5L. Each of these test pressures were maintained for a minimum period of ten seconds, and while under the full pressure the pipe was struck on or near the weld with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consoling metallurgist.

Several weeks prior to start of production, a pre-purchase meeting was held with the mill authorities. Among those present at this meeting were Mr. Brown and our inspector-in-charge. From this discussion, the mill agreed to follow a number of quality control suggestions made by Mr. Brown, and our inspector-in-charge reports that he was well satisfied with the attitude of the mill throughout the production of this pipe, and their willingness to follow to the letter, Mr. Brown's good advises. We were constantly in contact with Mr. Brown throughout this inspection run.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked with appropriate gages. In making this end inspection, our inspectors were particularly observant for any signs of laminations or other unsound material on the machined surface.

The outside diameter at each end of each length of pipe was checked by means of a slotted diameter tape, to insure that the minimum average diameter at the ends was not less than 29-31/32" nor more than 30-3/32".

On a spot check basis, but not less than three times per working turn, the outside diameter of the body of the pipe was checked by means of a diameter tape, to insure that the average diameter in the body was not less than 25-59/64" nor more than 30-7/32".

The ends of this pipe were continually checked throughout this inspection to insure that the out-of-roundness did not exceed plus or minus 1% of the nominal O.D. That is, to insure that the minor axis was not less than 29.7" and that the major axis was not greater than 30.3".

The wall thickness at each end of each length of pipe was checked by means of "go" and "no-go" gages to insure that the wall thickness at the ends was not less than 0.230" nor more than 0.299" in the case of the 0.250" wall item, not less than 0.450" nor more than 0.597" in the case of the 0.500" wall item (8% under and 19.5% over the respective nominal wall thicknesses).

Periodically throughout this inspection, the squareness of the ends with respect to the longitudinal axis of the pipe, was checked, and held to a maximum deviation of 1/16".

While making the surface inspection, but particularly while the pipe was rotating, it was closely observed by our inspectors, to insure that it did not deviate in straightness more than 1/2" in 40 ft.

In making their surface inspection, any area that had been ground to remove a surface defect, was carefully examined by our inspectors to insure that the defect had first been completely removed, and secondly that the depth of grind did not encroach upon the minimum wall thickness tolerance.

We permitted no repair by welding either to the longitudinal weld, or to the body of the pipe itself, after the pipe had been expanded. There actually was very little repair by welding performed by the mill, and in such cases, the welding was made by personnel qualified under Appendix B of API Std. 5LX. These qualification records were examined by our leed inspector.

Chemical Analyses:

This pipe was produced from basic-oxygen steel plates. We are listing below the results of ladle analyses for each heat of steel used to produce all of the pipe as covered by this report, together with the results of check analyses made on drillings taken from at least one length of pipe produced from each heat. The results of these analyses are as follows:

Chemical Analyses

Heat No.	Carbon	Manganese	Phosphorus	Sulphur	Silicon
30" O.D. x .250" Wall Grade X52 Pipe					
970181, ladle	.215%	1.08%	.005%	.020%	.050%
check	.21	1.09	.004	.022	.047
"	.21	1.09	.004	.022	.047
"	.21	1.08	.004	.021	.048
"	.22	1.09	.005	.022	.047
"	.215	1.08	.004	.021	.047
"	.21	1.08	.005	.021	.046
980031, ladle	.24	1.13	.007	.023	.020
check	.23	1.14	.006	.022	.020
"	.23	1.13	.006	.021	.021
"	.23	1.14	.007	.023	.021
"	.23	1.14	.006	.019	.020
"	.235	1.13	.006	.021	.021
970163, ladle	.22	1.08	.007	.021	.038
check	.21	1.10	.006	.022	.036
"	.215	1.09	.005	.021	.048

MOODY ENGINEERING C\ PANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Manufacturer Italsider 1691.0088.
Taranto, Italy.

Item No. 1.

Drawings :---

Specification API Standard 5LX & Client's Requirements.

Progress Report #13.

Accepted and released for shipment on: From September 6th, through September 10th, 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.---982,080'---30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees angle plus five degrees, minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---23,864 Pieces.---928,532'--0".

Present Inspection, OK:--- 2,018 Pieces.--- 77,937'--0".

Totals: 25,882 Pieces.---1,006,469'--0".

Average Overall length: 38.88"

In summary, your subject order is now completed in its entirety. Final report will be forwarded promptly upon receipt pertinent data from mill

Our inspector in charge of boatloading has advised that loading of the last boat the Pacific Skou will not begin until Monday September 15, 1969 as the boat will not arrive until sometime on Sunday September 14, 1969.

CLB

Enclosures:

For attention:

Sincerely,

Name of Inspector:

David Erlwein.

Date 9-11.

Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company.
cc: Mr. Herbert F. Brown, Metallurgical Consultant.

16.12.7

MOODY ENGINEERING CO ANY
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5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.
Item No. 1.

Manufacturer Italsider1691.0088.
Taranto, Italy.

Drawings: ----

Progress Report #12.

Specification API Std. 5LX & Client's Requirements.

Accepted and released for shipment on: From ~~September 3rd 11:00 PM until Saturday 7:00 AM September 6th 1969.~~ Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.----982,080'----30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---22,725 Pieces.---883,359'--0".

Present Inspection, OK:--- 1,139 Pieces.--- 45,173'--0".

Totals: 23,864 Pieces.---928,532'--0".

Average Overall length: 38.90".

Please be further advised. The Italsider mill expects to complete your order on 9-11-69. From the looks of things provided no further down time relative their Expander we should complete your subject order sometime during morning of September 10th, 1969.

In summary your present run is progressing normally. We shall continue to keep you advised.

Enclosures:

For attention:

Sincerely,
Name of Inspector
David Erlwein.

Date: 9-6-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline

16.12.1

MOODY ENGINEERING CO. ANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Manufacturer Italsider, 1691.0088
Taranto, Italy.

Item No. 1.

Drawings: ----

Progress Report #11.

Specification API 5LX, Client's Requirements.

Accepted and released for shipment on: ~~August 29th through~~ 2:00 PM September 3, 1969.

Rejected on:

Held in abeyance on: ---

Summary:

Item 1.----982,080'----30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

Report:

Previous Inspection OK:---20,471 Pieces.---796,658'--0"

Present Inspection, OK:--- 2,254 Pieces.--- 86,701'--0"

Totals: 22,725 Pieces.---883,359'--0"

Average Overall length: 38.87"

The Italsider mill expects to complete your subject order on or about September 11th, 1969.

In summary, we shall continue to keep you advised.

ROUTE	CONSULT	REPLY	CHECK & RETURN	INFORMATION
RHC				
CHB				
CLB				Comments
WMP				
JRW				
NGT				
RND				
WRW				
C				

Enclosures:

For attention:

Sincerely,

Name of Inspector David Erlwein.

Date: 9-4-69.

Signature D Erlwein.

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.

16.12.4

MOODY ENGINEERING CO ANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company I63-3592.

Item No. 1.

Manufacturer Italsider 1691.0088 Taranto, Italy.

Drawings: ----

Progress Report #10.

Specification API Std. 5LX & Client Requirements.

Accepted and released for shipment on: From August 18, 1969 thru 7:00AM August 21, 1969.

Rejected on: ----

Held in abeyance on: ----

Summary:

Item.1.--30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths, ends bevelled 30 degrees, angle plus five degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

Report:

Previous Inspection OK:---19,227 Pieces.---748,183'--6".

Present Inspection, OK:--- 1,244 Pieces.--- 48,474'--6".

Totals: 20,471 Pieces.---796,658'--0". Average length 38.91"

The Italsider mill is again scheduled to start up between August 28th and 30th 196
We shall continue to keep you advised.

	ROUTE	CONSULT	REPLY	CHECK & RETURN	INFORMATION
RHC					
CHB					
GLB					
WMP					
JRW					
NGT					
RND					
WHW					
CRV					

Enclosures:

For attention:

Sincerely,
Name of inspector
David Erlwein.

Date 8-22-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company.
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company.

MOODY ENGINEERING COM NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

16-12-7

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592

Item No. 1

Manufacturer: Italsider 1691.00 Taranto, Italy.

Drawings: ----

Specification: API Std. & Client' Requirements.

PROGRESS REPORT #2.

Accepted and released for shipment on: ---- Rejected on: ---- Held in abeyance on: ----

Summary: From 7:00 AM August 15th through 7:00 AM August 17, 1969.

Item 1.----983,080'-----30" x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32, for welding to API Standard 5LX, Latest Edition, and to Client's requirements.

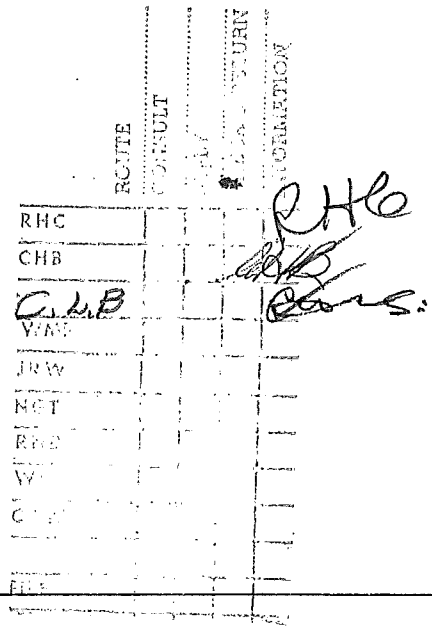
Report:

Previous Inspection OK:---17,870 Pieces---695,382'--6".

Present Inspection, OK:--- 1,357 Pieces--- 52,801'--0".

Totals: 19,227 Pieces---748,183'--6".

In summary, we shall continue to keep you advised.



Enclosures:

For attention:

Sincerely,
Name of inspector

David Erlwein.

Date: 8-17-69
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company

MOODY ENGINEERING COM NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592

Manufacturer Italsider 1691.0088 Taranto, Italy.

Item No. 1.

Drawings: ----

Specification API Std 5LX & Client's Requirements.

PROGRESS REPORT #8.

Accepted and released for shipment on: From August 11th through 7:00 AM August 15th, 1969. 24 hour strike on August 13, 1969.

Rejected on: ----

Held in abeyance on: ----

Item 1.----982,080'----30" DD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32", for welding to API Std 5LX Latest Edition, and to Client's Requirements.

Report:

Previous Inspection OK:---16,513 Pieces---642,537'--6"

Present Inspection, OK:--- 1,357 Pieces--- 52,845'--0"

Totals: 17,870 Pieces---695,382'--6"

Average overall length: 38.91"

The Essex Trader loading was completed On August 12, 1969 with a total number of loaded pieces of 3,022.

The Himmerland is expected to arrive at the Taranto port on Monday August 18, 1969 when loading will be resumed.

Our Pittsburgh Office, and Mr. Herbert F. Brown, have been advised by cable for transmittal to you that the Italsider mill will stop production of your order either on August 20 or 21, 1969 for a period of a week to ten days after which will resume production of your order.

In summary, we shall continue to keep you advised.

ROUTE | ACQUIT | SIGNATURE

RHC
CHB
E.L.B
WMP
JRW
GT
WND
WNW
CRW
FILE

Enclosures:

For attention:

Sincerely,
Name of inspector

Date: 8-15-69.
Signature

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592 Manufacturer: Italsider
Item No. 1. 1691.0088
Taranto, Italy.

Drawings: ----

PROGRESS REPORT #7. Specification: API Std. 5LX, Latest Edit. & Client's Req.

Accepted and released for shipment on: ~~XX From~~ 11:00 AM August 8th until ~~August 10th, 1969 7:00AM.~~ Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1.----982,080'----30" x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random lengths ends bevelled 30 degrees, angle plus 5 degrees minus zero, width of flat 1/16" plus or minus 1/32" for welding to API Standard 5LX, Latest Edition, and to Client's Requirements

Report:

Previous Inspection OK:---15,218 Pieces---592,077'--6".

Present Inspection, OK:--- 1,295 Pieces--- 50,460'--0"

Totals: 16,513 Pieces---642,537'--6"

Average overall length: 38.91"

Please find attached herewith for your review Ladle Analyses, Mill Control Check Analyses, Declaration of Quality, Circumference before and after expansion and percent of expansion, also copy of Burst Test conducted last week on selection of one pipe out of first hundred inspected.

Loaded on Essex Trader, until Sunday morning 8-10-68-2550. Pieces. Estimated completion and clearing 8-12-69.

Pipe quality and production at the moment is satisfactory. If there is any drastic change in the present situation you will be advised immediately by cable.

Enclosures:

For attention:

Name of inspector: Sincerely, David Erlwein.

Date: 8-10-69

Signature: DE

cc: Mr. Roger Clute, Interprovincial Pipeline Company
cc: Mr. Russell H. Sorensen, Lakehead Pipeline Company
cc: Mr. Herbert F. Brown, Metallurgical Consultant

16.12.9

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA. 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Item No. 1.

Manufacturer: Italsider, 1691 Taranto, Italy

Drawings: ----

Specification: API Standard 5LX Latest Edition & Client's Require

Accepted and released for shipment on: From August 2 through 8th--11:00 AM.

Rejected on: ---

Held in abeyance on: ---

Summary:

Report:

Item 1.---982,080'---30" OD x .250" Wall x 79.43# API Grade X-52 Submerged-arc welded cold-expanded steel linepipe, double random length ends bevelled 30 degrees, angle plus 5 degrees minus zero width of flat 1/16" plus or minus 1/32" for welding to API Standard 5LX, Latest Edition, and to Client's Requirement

Previous Inspection OK:----13,232 Pieces----514,999'--6".
Present Inspection, OK:---- 1986 Pieces---- 77,078'--0".
Totals: 15218 Pieces----592,077'--6".

The Italsider mill's target date for completion is 8-26-6 It is felt by Mr. Herbert F. Brown, and the writer that u existing circumstances the completion date will actually or about August 30th, 1969.

The foregoing is based on the considerable downtime we ar presently experiencing with the Expander. All features on production line are being closely followed by Moody Perso If we run into any particular difficulty which will effec completion as stated in foregoing will cable immediately. The present run is proceeding satisfactorily, and we are endeavoring to improve quality even more than present mat being offered for our inspection.

In summary, we shall continue to keep you advised.

Enclosures:

For attention:

Name of inspector: Sincerely,
David Erlwein.

Date: 8-8-6

Signature: D Erlwein

cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. R. Sorensen, Lakehead Pipeline Company

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
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PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

16-1-1 HHB
C.L.B.

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.

Item No. 1 & 2.

Manufacturer Italsider
1691.0088
Taranto, Italy.

Drawings :----

Progress Report #5.

Specification API Std. 5L & 5LX
Latest Edition &
Client's Requirements.

Accepted and released for shipment on: From February 13th through February 19th 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be API Std. 5LX, latest edition, and to client's requirements. Angle plus 5 degrees minus zero.

Report:

Previous Inspection OK.---11,087 Pieces.---432,263'
Present Inspection, OK.--- 2,145 Pieces.--- 82,736'-6"
Totals.----13,232 Pieces.---514,999'--6"

Item not complete. Balance of subject item as per the Italsider mill will be offered sometime between April 22 and 30th, 1969.

Item 2. 5,280'---30" x .500" wall x 157.53# API Grade B. submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 30 degrees for welding to be furnished to API Std. 5L, Latest edition and to client's requirements. Bevel angle 5 degrees plus minus zero.

Previous Inspection OK.---133 Pieces.---5,183'
Present Inspection, OK.--- 7 Pieces.--- 226'-6"

Totals.----140 Pieces.---5409'-6"

Item complete. Please note this 109'-6" over specified footage is subject to your approval, and the mill has been advised accordingly.

The mill has advised the writer that the tenative shipping date at the moment, will be between March 31st and April 15th 1969. Mr. H. F. Brown, during his visit was asked by the writer if you would want us to witness boat loading operation for proper loading and for damage at the port in Taranto, Italy? Therefore the writer would appreciate hearing from you, at your convenience relative your wishes concerning this matter so that proper provision can be made to handle this assignment promptly if you decide same is necessary?

Enclosures:

For attention:

Sincerely,
Name of inspector: David Erlwein.

Date 2-20-69.
Signature
D Erlwein

cc: Mr. R. Sorensen, Lakehead Pipeline Company.

16.14.1

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA, 15206 - U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-35-92.

Item No. 1

Manufacturer: Italsider
1691.0088
Taranto, Italy.

Drawings: ----

Progress Report #4.

Specification: API Std. 5LX Latest Edition & Client's Requirements.

Accepted and released for shipment on: From February 7th through February 12, 1969.

Rejected on: ----

Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" Wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be to API Std. 5LX, latest edition, and to client's requirements.

Report:

Previous Inspection OK---8,141 Pieces---317,326'
Previous Inspection OK---2,946 Pieces---114,937'
Present

Totals--11,097 " "---432,263'

Balance of present run is expected to be completed on or about February 18, 1969.

The mill has presently advised that our second run of material shall commence on April 22, 1969 and be completed on or about May 22, 1969.

In summary, we shall continue to keep you advised.

1" = 75' = 23 [illegible]

Enclosures:

C.L.B.

For attention:

Sincerely,

Inspector: David Erlwein.

Date: 2-7

Signature:

cc: Mr. R. Sorensen, Lakehead Pipeline Company
cc: Mr. Roger H. Clute, Interprovincial Pipeline Company

16.12.1

MOODY ENGINEERING COM..NY
227 FRIENDSHIP PLAZA BUILDING
5937 BROAD STREET MALL
PITTSBURG, PA. 15206 · U. S. A.

MOODY ENGINEERING COMPANY
VIA PAOLO FERRARI, 22
MARINA DI MASSA, ITALY 54037
EUROPEAN OPERATIONS

INSPECTION REPORT

Order Number: Lakehead Pipeline Company L63-3592.
Item No. 1.

Manufacturer: Italsider
1691.0088
Tarento, Italy.

Drawings: ----

PROGRESS REPORT 3.

Specification: API Std. 5LX Latest Edition, & Client's Requirements.

Accepted and released for shipment on: From January 30th through February 6th 1969. Rejected on: ---- Held in abeyance on: ----

Summary:

Item 1. 982,080'---30" x .250" wall x 79.43# API Grade X-52 submerged-arc welded cold-expanded steel linepipe, double random lengths ends beveled 30 degrees, width of flat 1/16" plus or minus 1/32" for welding to be API Std. 5LX, latest edition, and to client's requirements.

Report:

Previous Inspection OK---5,251 Pieces---204,758!
Present Inspection OK.---2,890 Pieces---112,566!
Totals:--8,141 Pieces---317,326!

Please find attached herewith for your review Ladle Analyses Mill Control Check Analyses.

The Italsider mill has now advised that we shall complete the present run of material on or about February 18, 1969. We are to again start the second run of material on or about March 29, 1969.

In summary, we shall continue to keep you advised.

112.5 / 6 = 18,700 ft/day

112.5 / 7 = 16,000 ft/day

Enclosures:

C.L.B.

Date: 2-7-69

For attention:

Name of inspector: David Erlwein.

Signature

cc: Mr. R. Sorensen, Lakehead Pipeline Company.
cc: Mr. Roger H. Clute, Interprovincial Pipeline Company
cc: Mr. H. E. Brown, Metallurgical Consultant.

MOODY ENGINEERING COMPANY
227 FRIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

ROUTE | CONSULT | REPLY | CHECK & RETURN | INFORMATION

RHC				
CHB				
CLB				
WMP				
JRW				
NGT				
RND				
WHW				
CRW				
FILE	16.12.7			

November 4, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. Walter A. Baltes, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #2

Gentlemen:

Referring to your purchase order #L63-3592, dated November 14, 1968, placed with Siderius, Inc., and covering as revised:

1,001,000 ft. of 30" O.D. x .250" wall x 79.43#/ft. API grade X52 submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5LX, latest edition.

5,280 ft. of 30" O.D. x .500" wall x 157.53#/ft. API grade B submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5L, latest edition.

we beg to report herewith on the inspection of all of the pipe furnished on the second and third runs.

The following material is covered by this report:

491,469.0 ft. of 30" O.D. x .250" wall API grade X52, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

This pipe was made at the Taranto, Italy plant of Italsider, where our inspection was conducted in compliance with your inspection order to us #L63-3897, dated January 6, 1969.

Specifications:

This pipe was manufactured and our inspection was conducted in accordance with API Std. 5LX, 16th Edition, dated April, 1969 for grade X52, submerged-arc welded, cold-expanded, basic-oxygen steel line pipe.

These specifications were supplemented per your Specification "Purchaser's Optional and Supplemental Requirements" attached to your purchase order.

Manufacture:

This pipe was made from steel plates. The plates as received from the plate mill have the edges prepared by trimming to the proper plate width by planing, at the same time slightly beveling the edges of the plate for welding. The plates are then formed into tubular shape by means of the standard crimping, U-ing and O-ing presses, forming the plate into cylindrical shape. Steel tabs are then welded on both ends of the can, in line with the open seam. Both the inside and outside welds start and stop on these tabs.

The inside weld bead is first deposited, starting and finishing the weld on the end tabs, and employing two weld headsin tandem. Both weld heads operate on alternating current. A flux back-up bar is used in making the inside weld, the pipe remaining stationary, the weld head traveling from the front end of the pipe to the back end of the pipe.

The outside weld bead is then deposited, also employing two welding heads in tandem. These two weld heads also operate on alternating current. The cylinder moves, with the welding head remaining stationary, the weld starting on the tab attached to one end of the pipe and finishing on the tab attached to the opposite end of the pipe. Good penetration is obtained between both outside and inside welds. The tabs are then removed from the ends of the pipe.

The cylinder, as formed and welded, is smaller in diameter than the specified nominal diameter of 30" O.D. The pipe is expanded to final diameter by hydraulic internal pressure while being held enclosed within a closed cylinder.

Our inspector-in-charge reports that the expanding pressure for this pipe was 1,050 psi. Diameter readings taken on a spot check basis throughout this run, before and after expansion, indicate that the pipe was expanded from .80% to 1.50%. The expansion was thus well below the 2.0% maximum expansion permitted by your specification.

The mill hydrostatic pressure test is applied to the pipe immediately following the expanding operation, and with the same equipment, but with the retaining dies released so that the pipe is not restricted during the mill hydrostatic test.

The pipe then proceeds to facing machined were both ends of the pipe are faced and beveled.

The ends of this pipe were beveled at an angle of 30° to the vertical, plus 5°, minus 0°, with an average width of root face at the ends of the pipe of 1/16", plus or minus 1/32".

The inside weld bead is then ground off flush with the internal surface of the pipe for a distance of approximately 2" from the ends.

Nondestructive Testing:

Prior to expansion, the longitudinal weld for it's full length (with the exception of a few inches at each end) is checked by means of ultrasonic equipment. The ultrasonic equipment is of Italian manufacture,

employing four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repair area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Test:

Each length of this pipe was subjected to a minimum hydrostatic pressure test of 780 psi, the full test pressure being maintained for a minimum period of ten seconds. While under the full pressure, the pipe was struck on or near the weld, with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consoling metallurgist. Mr. Brown did not return to the mill personally for the second and third runs of this pipe, as covered by this report. However, Mr. Brown was in constant communication by telephone and letter with our lead inspector at the mill, and assured himself that his instructions to us as set forth at the time that production of pipe on your order originally commenced early this year, were being fully followed and complied with.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked

with appropriate gages. In making this end inspection, our inspectors were particularly observant for any signs of laminations or other unsound material on the machined surface.

The outside diameter at each end of each length of pipe was checked by means of a slotted diameter tape, to insure that the minimum average diameter at the ends was not less than 29-31/32" nor more than 30-3/32".

On a spot check basis, but not less than three times per working turn, the outside diameter of the body of the pipe was checked by means of a diameter tape, to insure that the average diameter in the body was not less than 29-59/64" nor more than 30-7/32".

The ends of this pipe were continually checked throughout this inspection to insure that the out-of-roundness did not exceed plus or minus 1% of the nominal O.D. That is, to insure that the minor axis was not less than 29.7" and that the major axis was not greater than 30.3".

The wall thickness at each end of each length of pipe was checked by means of "go" and "no-go" gages to insure that the wall thickness at the ends was not less than 0.230" nor more than 0.299" (8% under and 19.5% over the nominal wall thickness of 0.250").

Periodically throughout this inspection, the squareness of the ends with respect to the longitudinal axis of the pipe, was checked, and held to a maximum deviateion of 1/16".

While making thesurface inspection, but particularly while the pipe was rotating, it was closely observed by our inspectors, to insure that it did not deviate in straightness more than 3/4" in 40 ft.

In making their surface inspection, any area that had been ground to remove a surface defect, was carefully examined by our inspectors to insure that the defect had first been completely removed, and secondly that the depth of grind did not encroach upon the minimum wall thickness tolerance.

We permitted no repair by welding either to the longitudinal weld, or to the body of the pipe itself, after the pipe had been expanded. There actually was very little repair by welding performed by the mill, and in such cases, the welding was made by personnel qualified under Appendix B of API Std. 5LX. These qualification records were examined by our lead inspector.

Chemical Analyses:

This pipe was produced from basic-oxygensteel plates. We are listing below the results of ladle analyses for each heat of steel used to produce all of the pipe as covered by this report, together with the results of check analyses made on drillings taken from at least one length of pipe produced from each heat. The results of these analyses are as follows:

MOODY ENGINEERING COMPANY

227 FRIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

March 18, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. R. H. Sorenson, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #1

Gentlemen:

Referring to your purchase order #L63-3592, dated November 14, 1968, placed with Siderius, Inc., and covering:

982,080 ft. of 30" O.D. x .250" wall x 79.43#/ft. API grade X52 submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5LX, latest edition.

5,280 ft. of 30" O.D. x .500" wall x 157.53#/ft. API grade B submerged-arc welded cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5L, latest edition.

We beg to report herewith on the inspection of all of the pipe furnished on the first mill run.

The following material is covered by this report:

514,999.5 ft. of 30" O.D. x .250" wall API grade X52, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

5,409.5 ft. of 30" O.D. x .500" wall API grade B, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

NOTE: It will be noted that the second item was inspected with an overage of 129.5 ft. We are advised that the mill is seeking your approval to ship this small excess.

This pipe was made at the Taranto, Italy plant of Italsider, where our inspection was conducted in compliance with your inspection order to us #L63-3897, dated January 6, 1969.

Specifications:

This pipe was manufactured and our inspection was conducted in accordance with API Std. 5LX, 15th Edition, dated March, 1968 for grade X52, submerged-arc welded, cold-expanded, basic-oxygen steel line pipe (.250" wall pipe) and API Std. 5L, 23rd Edition, dated March, 1968 for grade B, submerged-arc welded, basic-oxygen steel line pipe (.500" wall pipe).

These specifications were supplemented per your Specification "Purchaser's Optional and Supplemental Requirements" attached to your purchase order.

Manufacture:

This pipe was made from steel plates. The plates as received from the plate mill have the edges prepared by trimming to the proper plate width by planing, at the same time slightly beveling the edges of the plate for welding. The plates are then formed into tubular shape by means of the standard crimping, U-ing and O-ing presses, forming the plate into cylindrical shape. Steel tabs are then welded on both ends of the can, in line with the open seam. Both the inside and outside welds start and stop on these tabs.

The inside weld bead is first deposited, starting and finishing the weld on the end tabs, and employing two weld heads in tandem. Both weld heads operate on alternating current. A flux back-up bar is used in making the inside weld, the pipe remaining stationary, the weld head traveling from the front end of the pipe to the back end of thepipe.

The outside weld bead is then deposited, also employing two welding heads in tandem. These two weld heads also operate on alternating current. The cylinder moves, with the welding head remaining stationary, the weld starting on the tab attached to oneend of the pipe and finishing on the tab attached to the opposite end of the pipe. Good penetration is obtained between both outside and inside welds. The tabs are then removed from the ends of the pipe.

The cylinder, as formed and welded, is smaller in diameter than the specified nominal diameter of 30" O.D. The pipe is expanded to final diameter by hydraulic internal pressure while being held enclosed within a closed cylinder.

Our inspector-in-charge reports that the expanding pressure for the .250" wall pipe was 1,050 psi, while the expanding pressure for the .500" wall pipe was 1,100 psi.

On approximately two lengths of pipe per turn, circumferential measurements were taken at eight places along the pipe length, these measurements being taken both before and after expansion. From these measurements, the percentage expansion on the .250" wall pipe ranged from .90% to 1.40% with the averagebeing approximately 1.25%. On the .500" wall pipe, the expansion figures ranged from .97% to 1.23%, with the average being approximately 1.05%.

It will be noted that the expansion on the .250" wall pipe was well below the 2.0% maximum as called for by your specification.

The mill hydrostatic pressure test is applied to the pipe immediately following the expanding operation, and with the same equipment, but with the retaining dies released so that the pipe is not restricted during the mill hydrostatic test.

The pipe then proceeds to facing machines were both ends of the pipe are faced and beveled.

Your original order called for this pipe to be beveled 37-1/2°, plus or minus 2-1/2°. The ends of this pipe were beveled in this manner up to approximately January 20, at which time we were advised of a change in your requirements, and the pipe was then beveled in the standard manner of 30° to the vertical, plus 5°, minus 0°. In all cases, the average width of root face at the ends of the pipe was 1/16", plus or minus 1/32".

The inside weld bead is then ground off flush with the internal surface of the pipe for a distance of approximately 2" from the ends.

Nondestructive Testing:

Prior to expansion, the longitudinal weld for it's full length (with the exception of a few inches at each end) is checked by means of ultrasonic equipment. The ultrasonic equipment is of Italian manufacture, employing four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repair area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Tests:

Each length of the .250" wall pipe was subjected to a minimum hydrostatic pressure test of 780 psi, while each length of .500" wall pipe was subjected to a minimum hydrostatic pressure test of 880 psi. It will be noted that the test pressure on the .500" wall item is the alternate test pressure for pipe of this size and grade, as called for by API Std. 5L. Each of these test pressures were maintained for a minimum period of ten seconds, and while under the full pressure the pipe was struck on or near the weld with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consoling metallurgist.

Several weeks prior to start of production, a pre-purchase meeting was held with the mill authorities. Among those present at this meeting were Mr. Brown and our inspector-in-charge. From this discussion, the mill agreed to follow a number of quality control suggestions made by Mr. Brown, and our inspector-in-charge reports that he was well satisfied with the attitude of the mill throughout the production of this pipe, and their willingness to follow to the letter, Mr. Brown's good advises. We were constantly in contact with Mr. Brown throughout this inspection run.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked with appropriate gages. In making this end inspection, our inspectors were particularly observant for any signs of laminations or other unsound material on the machined surface.

The outside diameter at each end of each length of pipe was checked by means of a slotted diameter tape, to insure that the minimum average diameter at the ends was not less than 29-31/32" nor more than 30-3/32".

On a spot check basis, but not less than three times per working turn, the outside diameter of the body of the pipe was checked by means of a diameter tape, to insure that the average diameter in the body was not less than 25-59/64" nor more than 30-7/32".

The ends of this pipe were continually checked throughout this inspection to insure that the out-of-roundness did not exceed plus or minus 1% of the nominal O.D. That is, to insure that the minor axis was not less than 29.7" and that the major axis was not greater than 30.3".

The wall thickness at each end of each length of pipe was checked by means of "go" and "no-go" gages to insure that the wall thickness at the ends was not less than 0.230" nor more than 0.299" in the case of the 0.250" wall item, not less than 0.450" nor more than 0.597" in the case of the 0.500" wall item (8% under and 19.5% over the respective nominal wall thicknesses).

Periodically throughout this inspection, the squareness of the ends with respect to the longitudinal axis of the pipe, was checked, and held to a maximum deviation of 1/16".

While making the surface inspection, but particularly while the pipe was rotating, it was closely observed by our inspectors, to insure that it did not deviate in straightness more than 1/2" in 40 ft.

In making their surface inspection, any area that had been ground to remove a surface defect, was carefully examined by our inspectors to insure that the defect had first been completely removed, and secondly that the depth of grind did not encroach upon the minimum wall thickness tolerance.

We permitted no repair by welding either to the longitudinal weld, or to the body of the pipe itself, after the pipe had been expanded. There actually was very little repair by welding performed by the mill, and in such cases, the welding was made by personnel qualified under Appendix B of API Std. 5LX. These qualification records were examined by our lead inspector.

Chemical Analyses:

This pipe was produced from basic-oxygen steel plates. We are listing below the results of ladle analyses for each heat of steel used to produce all of the pipe as covered by this report, together with the results of check analyses made on drillings taken from at least one length of pipe produced from each heat. The results of these analyses are as follows:

Chemical Analyses

Heat No.	Carbon	Manganese	Phosphorus	Sulphur	Silicon
30" O.D. x .250" Wall Grade X52 Pipe					
970181, ladle	.215%	1.08%	.005%	.020%	.050%
check	.21	1.09	.004	.022	.047
"	.21	1.09	.004	.022	.047
"	.21	1.08	.004	.021	.048
"	.22	1.09	.005	.022	.047
"	.215	1.08	.004	.021	.047
"	.21	1.08	.005	.021	.046
980031, ladle	.24	1.13	.007	.023	.020
check	.23	1.14	.006	.022	.020
"	.23	1.13	.006	.021	.021
"	.23	1.14	.007	.023	.021
"	.23	1.14	.006	.019	.020
"	.235	1.13	.006	.021	.021
970163, ladle	.22	1.08	.007	.021	.038
check	.21	1.10	.006	.022	.036
"	.215	1.09	.005	.021	.048

16.12.7

OY ENGINEERING COMPANY

RIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

November 17, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. Walter A. Baltes, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #2

Gentlemen:

On November 4, 1969, we rendered to you our inspection report covering the second and third runs of pipe furnished on your above order, and inspected by us at the Taranto, Italy plant of Italseder, S.P.A.

It has come to our attention that a serious mis-statement occurs on page 3 of this report.

Under the heading "Inspection", we indicate that Mr. H. F. Brown was not present at the mill at any time during the run of this pipe. This statement is totally incorrect, as Mr. Brown was physically present at the mill, at the time that the second run of this pipe commenced.

We are most distraut by this inaccuracy on our part, and in an endeavor to rectify the situation, we have retyped copies of page 3 of our report, and would ask that said pages be substituted in our report for the original page containing the serious mis-information.

We trust that you will accept our sincere apologies for this oversight on our part, and for the inconvenience that it has caused to all parties concerned.

Yours very truly,

MOODY ENGINEERING COMPANY

ORIGINAL SIGNED
PAUL A. MILLS

Paul A. Mills
President

pam:al

cc Mr. Charles Buckley
Interprovincial Pipe Line Company
Centennial Building
100 Street & 103 Avenue
Edmonton, Alberta, Canada

ploying four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repaired area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Test:

Each length of this pipe was subjected to a minimum hydrostatic pressure test of 780 psi, the full test pressure being maintained for a minimum period of ten seconds. While under the full pressure, the pipe was struck on or near the weld, with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consulting metallurgist. Mr. Brown was present in the mill when production of the second run of pipe as covered by this report, commenced. Mr. Brown remained in the mill for several days, until he was satisfied that the mill was setup to produce quality pipe, and that our lead inspector was following his directions. Although Mr. Brown was not physically present at the start of the third run of this pipe, he was in constant communication by telephone and letter with our lead inspector at the mill, and assured himself that his instructions to us were being followed.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked

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227 FRIENDSHIP PLAZA BUILDING • 5937 BROAD STREET MALL • PITTSBURGH, PENNSYLVANIA 15206 • PHONE (412) 361-6263

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November 4, 1969

Lakehead Pipe Line Company, Inc.
3025 Tower Avenue
Superior, Wisconsin 54880

Attention: Mr. Walter A. Baltes, Purchasing Agent

Your Inspection Order #L63-3897
Your Purchase Order #L63-3592 - Report #2

Gentlemen:

Referring to your purchase order #L63-3592, dated November 14, 1968, placed with Siderius, Inc., and covering as revised:

1,001,000 ft. of 30" O.D. x .250" wall x 79.43#/ft. API grade X52 submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5LX, latest edition.

5,280 ft. of 30" O.D. x .500" wall x 157.53#/ft. API grade B submerged-arc welded, cold-expanded steel line pipe, double random lengths, ends beveled 37-1/2° for welding, to be shipped bare, free of mill coating, and to be furnished in accordance with API Std. 5L, latest edition.

we beg to report herewith on the inspection of all of the pipe furnished on the second and third runs.

The following material is covered by this report:

491,469.0 ft. of 30" O.D. x .250" wall API grade X52, submerged-arc welded, cold-expanded steel line pipe, ends beveled 30° for welding.

This pipe was made at the Taranto, Italy plant of Italsider, where our inspection was conducted in compliance with your inspection order to us #L63-3897, dated January 6, 1969.

Specifications:

This pipe was manufactured and our inspection was conducted in accordance with API Std. 5LX, 16th Edition, dated April, 1969 for grade X52, submerged-arc welded, cold-expanded, basic-oxygen steel line pipe.

These specifications were supplemented per your Specification "Purchaser's Optional and Supplemental Requirements" attached to your purchase order.

Manufacture:

This pipe was made from steel plates. The plates as received from the plate mill have the edges prepared by trimming to the proper plate width by planing, at the same time slightly beveling the edges of the plate for welding. The plates are then formed into tubular shape by means of the standard crimping, U-ing and O-ing presses, forming the plate into cylindrical shape. Steel tabs are then welded on both ends of the can, in line with the open seam. Both the inside and outside welds start and stop on these tabs.

The inside weld bead is first deposited, starting and finishing the weld on the end tabs, and employing two weld headsin tandem. Both weld heads operate on alternating current. A flux back-up bar is used in making the inside weld, the pipe remaining stationary, the weld head traveling from the front end of the pipe to the back end of the pipe.

The outside weld bead is then deposited, also employing two welding heads in tandem. These two weld heads also operate on alternating current. The cylinder moves, with the welding head remaining stationary, the weld starting on the tab attached to one end of the pipe and finishing on the tab attached to the opposite end of the pipe. Good penetration is obtained between both outside and inside welds. The tabs are then removed from the ends of the pipe.

The cylinder, as formed and welded, is smaller in diameter than the specified nominal diameter of 30" O.D. The pipe is expanded to final diameter by hydraulic internal pressure while being held enclosed within a closed cylinder.

Our inspector-in-charge reports that the expanding pressure for this pipe was 1,050 psi. Diameter readings taken on a spot check basis throughout this run, before and after expansion, indicate that the pipe was expanded from .80% to 1.50%. The expansion was thus well below the 2.0% maximum expansion permitted by your specification.

The mill hydrostatic pressure test is applied to the pipe immediately following the expanding operation, and with the same equipment, but with the retaining dies released so that the pipe is not restricted during the mill hydrostatic test.

The pipe then proceeds to facing machined were both ends of the pipe are faced and beveled.

The ends of this pipe were beveled at an angle of 30° to the vertical, plus 5°, minus 0°, with an average width of root face at the ends of the pipe of 1/16", plus or minus 1/32".

The inside weld bead is then ground off flush with the internal surface of the pipe for a distance of approximately 2" from the ends.

Nondestructive Testing:

Prior to expansion, the longitudinal weld for it's full length (with the exception of a few inches at each end) is checked by means of ultrasonic equipment. The ultrasonic equipment is of Italian manufacture,

employing four probes, two transmitters and two receivers. (Set at an angle of 70°). The rate of travel of the pipe under the ultrasonic equipment is approximately 40 ft. per minute.

After expansion, the end weld at each end of each length of pipe is X-rayed for a distance of at least 16" from each end.

After end weld X-ray, the complete longitudinal weld is once again checked by means of ultrasonic equipment, of the same type as described hereinbefore.

Any defects in the longitudinal weld disclosed by the ultrasonic testing procedure, which are repaired by chipping out and re-welding, are usually checked by X-raying the repair area.

Our lead inspector as well as our bench inspectors, continuously monitored the nondestructive testing operations, and examined and passed judgment on approximately 70% of the X-ray film.

Mill Hydrostatic Pressure Test:

Each length of this pipe was subjected to a minimum hydrostatic pressure test of 780 psi, the full test pressure being maintained for a minimum period of ten seconds. While under the full pressure, the pipe was struck on or near the weld, with a volley of hammer blows.

Continuously throughout their inspection, our inspectors spot checked on this testing operation, examining the pressure gage, the time cycle and the recording chart, and in all cases found the test being carried out in the prescribed manner.

Inspection:

This inspection was conducted under the direct supervision of Mr. H. F. Brown, your consoling metallurgist. Mr. Brown did not return to the mill personally for the second and third runs of this pipe, as covered by this report. However, Mr. Brown was in constant communication by telephone and letter with our lead inspector at the mill, and assured himself that his instructions to us as set forth at the time that production of pipe on your order originally commenced early this year, were being fully followed and complied with.

Each length of this pipe was given a careful surface inspection on the outside by our inspectors walking along the pipe from end to end, while it was stationary, examining the longitudinal weld. Then they walked back along the pipe, while it was rotating, examining the outside surface in approximately 4 ft. segments.

The inside weld and surface of the pipe was inspected by our inspectors passing through each length on a dolly, carrying with them a handlight to aid in this inside inspection. The inside surface of each length was also examined by sighting from each end, aided by high powered lights.

The angle of bevel and width of root face at each end of each length of pipe was carefully examined, and on a spot check basis checked

with appropriate gages. In making this end inspection, our inspectors were particularly observant for any signs of laminations or other unsound material on the machined surface.

The outside diameter at each end of each length of pipe was checked by means of a slotted diameter tape, to insure that the minimum average diameter at the ends was not less than 29-31/32" nor more than 30-3/32".

On a spot check basis, but not less than three times per working turn, the outside diameter of the body of the pipe was checked by means of a diameter tape, to insure that the average diameter in the body was not less than 29-59/64" nor more than 30-7/32".

The ends of this pipe were continually checked throughout this inspection to insure that the out-of-roundness did not exceed plus or minus 1% of the nominal O.D. That is, to insure that the minor axis was not less than 29.7" and that the major axis was not greater than 30.3".

The wall thickness at each end of each length of pipe was checked by means of "go" and "no-go" gages to insure that the wall thickness at the ends was not less than 0.230" nor more than 0.299" (8% under and 19.5% over the nominal wall thickness of 0.250").

Periodically throughout this inspection, the squareness of the ends with respect to the longitudinal axis of the pipe, was checked, and held to a maximum deviateion of 1/16".

While making thesurface inspection, but particularly while the pipe was rotating, it was closely observed by our inspectors, to insure that it did not deviate in straightness more than 3/4" in 40 ft.

In making their surface inspection, any area that had been ground to remove a surface defect, was carefully examined by our inspectors to insure that the defect had first been completely removed, and secondly that the depth of grind did not encroach upon the minimum wall thickness tolerance.

We permitted no repair by welding either to the longitudinal weld, or to the body of the pipe itself, after the pipe had been expanded. There actually was very little repair by welding performed by the mill, and in such cases, the welding was made by personnel qualified under Appendix B of API Std. 5LX. These qualification records were examined by our lead inspector.

Chemical Analyses:

This pipe was produced from basic-oxygensteel plates. We are listing below the results of ladle analyses for each heat of steel used to produce all of the pipe as covered by this report, together with the results of check analyses made on drillings taken from at least one length of pipe produced from each heat. The results of these analyses are as follows:

The results of these four burst tests have been furnished to you by the mill, in booklet form. We have reviewed the results of these four burst tests, and judged them to be satisfactory. We therefore are not including in this inspection report any of the burst test data, as it would be redundant.

Preparation for Shipment:

All of this pipe was shipped bare, free of mill coating.

Our inspection mark "ME" was stenciled on the inside near one end of each length of pipe in line with the other mill markings.

The following marks were paint stenciled on the inside near one end of each length: "LAKEHEAD L63-3592 30" x .250" 79.43 X52 E BO 780 PSI". The API monogram, and the actual length in feet and decimals of a foot, and actual weight in pounds, of the individual length, were paint stenciled in line with these markings. At the opposite end of each length, the following markings were paint stenciled: "30" x .250" X52".

In addition, for identification purposes, two purple paint bands approximately 2" wide were painted around the outside near each end of each length.

All markings applied to this pipe during the manufacturing operation, were paint stenciled, no steel die-stamping being permitted.

The following quantities of pipe were accepted by us for shipment on this second and third production runs:

Pieces	Footage
12,650	491,469.5'

Our report #1, dated March 18, 1969, covered our inspection of the pipe furnished on the first production run on this order. The total quantities of pipe accepted by us for shipment on your order in toto, is as follows:

	Pieces	Footage
Report #1	13,232	514,999.50'
Report #2	12,650	491,469.50'
Total	25,882	1,006,469.00'

We did inspect a slight excess of pipe, in order that replacement pipe would be available for any damaged in transportation to the dock, or loading aboard vessel. The total quantities of pipe actually shipped against this order are as follows:

Pieces	Footage	Weight
30" O.D. x .250" Wall Pipe		
25,749	100,214.30'	80,947,194#
30" O.D. x .500" Wall Pipe		
140	5,407.20'	862,600#

The average length and weight per foot of the total quantities of pipe shipped, as reflected in the above figures, is as follows:

30" O.D. x .250" Wall Pipe

Average Length - 38'11- 3/64"
Average Wt./Ft. - 80.774# (approx. 1.69% over the nominal weight)

30" O.D. x .500" Wall Pipe

Average Length - 38' 7-15/32"
Average Wt./Ft. - 159.528# (approx. 1.26% over the nominal weight)

We had personnel stationed at the dock at the time of loading, supervising and inspecting the loading of this pipe, and the results of our loading inspection are covered by separate inspection report being rendered to you.

Conclusion:

In conclusion, we wish to state that the pipe furnished on this order received our careful inspection, and having been found to be satisfactory was accepted by us for shipment, subject to your shipping instructions.

Yours very truly,

MOODY ENGINEERING COMPANY

ORIGINAL SIGNED BY
PAUL A. MILLS

Paul A. Mills

PAM:hs

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