In Reply Refer To: MS 5232

Shell Oil Company
Attention: Mr. P. E. Wallace
Post Office Box 2648
Houston, Texas 77252

Gentlemen:

Your application dated April 27, 1994, to install, operate, and maintain a 12-inch subsea tie-in as an appurtenance to existing pipeline Right-of-Way OCS-G 1686, Segment No. 3459 at coordinates x = 1,081,818 and y = 10,556,782 in Block 62, South Pass Area is hereby approved, as proposed.

Additionally, pursuant to 30 CFR 250.150(b), your request to modify the above-captioned pipeline right-of-way to allow for the aforementioned action is hereby granted.

This approval is subject to the following:

Shell Oil Company shall submit a hydrostatic pressure test report of the subject modification to this office within 30 days upon completion.

Based on our analysis of the application, the maximum allowable operating pressure for this subsea valve assembly will be 1,440 psig.

Sincerely,

[Signature]

William H. Martin
Acting Regional Supervisor
Field Operations

bcc: 1502-01 F/L OCS-G 1686 w/orig appln (KFaust) (MS 5232)
\[1502-01 F/L OCS-G 1686 w/cy of appln (microfilm) (MS 5033)
MS 5250

MConner:amm:5/19/94:Shell.686
April 27, 1994

Mr. D. J. Bourgeois
Minerals Management Service
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Dear Mr. Bourgeois:

OFFSHORE LOUISIANA
CONNECTION TO SHELL OIL COMPANY PIPELINE
12-INCH OIL FLOWLINE OCS-G-1686
SOUTH PASS AREA BLOCK 62

APPLICATION FOR PIPELINE CONNECTION

Pursuant to the authority granted in U.S.C. 1334 (e) and the regulations contained in Title 30 CFR Part 250 Subpart J, Shell Oil Company is filing this application for permission to allow the connection of a BP Exploration 12-inch oil flowline to Shell Oil Company's existing 12-inch oil flowline in South Pass Area Block 62, all in offshore waters, Gulf of Mexico. Shell agrees that this pipeline connection, if approved, will be subject to the terms and conditions of said regulations.

In support of this application enclosed are three copies each of the following:

- Location Map
- Pipeline Route
- Pipeline Route - Profile
- Pipeline Route - General
- Pipeline System - Specifications
- Pipeline System - Safety Schematic
- Technical Attachment
- Vicinity Map
- Route Plan and Profile Sheet
- J-Tube Details
- Tie-In Spool Arrangement

The Design of the pipeline is in accordance with the "Minimum Federal Safety Standards (Department of Transportation) Title 49 CFR 195".

Shell Oil Company wishes to "hereby certify that the proposed activity described in this application complies with and will be conducted in a manner that is consistent with the Coastal Zone Management Program for the State of Louisiana".
Shell Oil Company also agrees to the following stipulation:

Shell Oil Company hereby agrees to keep open at all reasonable times for inspection by the Minerals Management Service, the area covered by this right-of-way and all improvements structures and fixtures thereon and all records relative to the design, construction, operation, maintenance and repairs, or investigations or with regard to such area.

Please refer to your New Orleans Miscellaneous File Number 117 for a copy of Shell Oil Company's charter and authority for the undersigned as Attorney-in-Fact of Shell Oil Company to sign for and on behalf of Shell.

If the above and attached information meets with your approval, please issue the necessary permit for the connection at your earliest convenience. Inquires concerning this application may be directed to Shell Oil Company c/o Shell Pipe Line Corporation, P. O. Box 2648, Houston, Texas 77252-2648, or by telephoning Mr. E. F. Paul at 713/241-3485.

Yours very truly,

P. E. Wallace
Attorney-in-Fact

Attachments
LEASE HOLDER

SOUTH PASS AREA

BLOCK 62
OCS-G-1294

Shell Frontier Oil and Gas Inc. (a wholly owned subsidiary of Shell Offshore Inc.)
UNITED STATES
DEPARTMENT OF THE INTERIOR
MINERAL MANAGEMENT SERVICE

NON-DISCRIMINATION IN EMPLOYMENT

As a condition precedent to the approval of the granting of the subject pipeline right-of-way, the Grantee Shell Oil Company, hereby agrees and consents to the following stipulation which is to be incorporated into the application of said right-of-way.

During this performance of this grant the Grantee agrees as follows:

During the performance under this grant, the grantee shall fully comply with paragraphs (1) through (7) of section 202 of the Executive Order 11246, as amended, (reprinted in 41 CFR 60-1.4 (a) ), which are for the propose of preventing discrimination against persons on the basis of race, color, religion, sex or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this grant by reference.

Shell Oil Company

Signature of Grantee
P. E. Wallace, Attorney-in-Fact

Date: April 27, 1994
The design characteristics of this pipeline are in compliance with D.O.T. regulations.

Total Length = 57,508.2 feet = 10.892 miles

Tie-In to Existing Shell 12" Pipeline
X = 1,081,818.0'
Y = 10,556,782.0'
Lat. = 29°44'40.77" N
Lon. = 88°44'57.12" W
STA 575+08.2'

SOUTH PASS AREA

VIOSCA KNOLL AREA

Block Crossing
X = 1,081,841.1'
Y = 10,553,830.0'
Lat. = 29°44'11.55" N
Lon. = 88°44'56.38" W
STA 545+36.7'

Block Crossing
X = 1,082,584.0'
Y = 10,549,440.0'
Lat. = 29°32'28.20" N
Lon. = 88°44'47.26" W
STA 500+30.7'

Proposed 12" Oil Pipeline

P.T. 2
X = 1,081,841.1'
Y = 10,552,578.1'
Lat. = 29°3'59.16" N
Lon. = 88°44'56.15" W
STA 532+84.8'

Block Crossing
X = 1,084,865.3'
Y = 10,546,816.8'
Lat. = 29°3'2.56" N
Lon. = 88°44'21.12" W
STA 465+17.5'

Curve 2
Angle = 55°23'29" R
Radius = 7,000.0'
Length = 6,767.3'

The RIGHT-OF-WAY of proposed pipeline is accurately represented.

BP Exploration, Inc.

Viosca Knoll 989 Oil Export Pipeline

<table>
<thead>
<tr>
<th>BP Exploration, Inc.</th>
<th>Viosca Knoll 989 Oil Export Pipeline</th>
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</thead>
<tbody>
<tr>
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<td>Drawn By</td>
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<td></td>
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<td>Date 4/4/94</td>
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<td>Approved By</td>
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<td>Prepared by</td>
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<td>Hudson Engineering Corp.</td>
<td>Houston, Texas</td>
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<td>Pipeline Route (Sheet 4 of 4)</td>
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<td></td>
<td>Rev.No. 0</td>
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</table>
Additional design criteria for the 12-inch oil pipeline are as follows:

1. The route of the proposed pipeline, the water depth along the route, and the profile of the pipeline in relationship to the natural bottom is shown on the attached Drawing Numbers AX-9301, AX-9302, AX-9303, AX-9304, AX-9305, AX-9306 and AX-9307.

2. The description of the pipe and coating is as follows:
   a. Line Pipe
     Deep water section (31,328.0 feet) is 12.750-inch O.D. X 0.562-inch W.T., API 5L-X60; bare weight is 73.2 pounds per linear foot; coated with 14-16 mils of fusion bonded epoxy. Coated weight is 73.6 pounds per linear foot, resulting in an empty pipe specific gravity of 1.291 in sea water (with density of 64 pounds per cubic foot).

     Shallow water section is 12.750-inch O.D. X 0.438-inch W.T., API 5L-X60; bare weight is 57.6 pounds per linear foot; coated with 14-16 mils of fusion bonded epoxy and 1.00 inch of concrete with density of 140 pounds per cubic foot. Coated weight is 98.9 pounds per linear foot, resulting in an empty pipe specific gravity of 1.298 in sea water (with density of 64 pounds per cubic foot).

   b. Riser Pipe
     12.750-inch O.D. X 0.562-inch W.T., API 5L-X60; bare weight is 73.2 pounds per linear foot; coated with 0.500-inch Splashtron. Coated weight is 86.8 pounds per linear foot, resulting in an empty pipe specific gravity of 1.315 in sea water (with density of 64 pounds per cubic foot).

   c. Subsea Tie-In Assembly Piping
     12.750-inch O.D. X 0.438-inch W.T., API 5L-X60; bare weight is 57.6 pounds per linear foot; coated with 14-16 mils of fusion bonded epoxy and 1.00 inch of concrete with density of 140 pounds per cubic foot. Coated weight is 98.9 pounds per linear foot, resulting in an empty pipe specific gravity of 1.298 in sea water (with density of 64 pounds per cubic foot).

   d. Internal Coating
     The analysis of the transported products will be monitored, and preventative measures such as pigging and/or inhibiting will be employed as necessary.
Existing Shell Oil Company 12" Pipeline (MAOP 1440 PSI)

12" ANSI 900# Ball Valves,
Check Valves & Safety Joint;
Safety Joint Separation Load
70 kips

SOUTH PASS UNDERWATER TIE - IN AREA
BLOCK 62

A = 12.750" O.D. x 0.562" W.T., API 5L-X60,
with 14 - 16 MIL fusion bond epoxy (coated
pipe wt. 73.6 lb./ft.)

B = 12.750" O.D. x 0.438" W.T., API 5L-X60,
with 14 - 16 MIL fusion bond epoxy and 1" 140
pcf concrete (coated pipe wt. 98.9 lb./ft.)

C = Sacrificial anodes 104 lbs. each; spacing to
be at maximum 320' centers.

D = Sacrificial anodes 112 lbs. each; spacing to
be at maximum 320' centers.

12.750" O.D. x 0.562" W.T.,
API 5L-X60 Riser Pipe with
1/2 - inch Splashtron
(Coated Pipe Wt. 86.8 lb./ft.)

GENERAL NOTES

1. BP Exploration pipeline facilities comply with
   Part 195, Title 49 of the Code of Federal
   Regulations.

2. BP Exploration platform facilities comply with
   Part 195, Title 49 of the Code of Federal
   Regulations and with ANSI B 31.3 Regulations.

3. High pressure sensor will be set at 1360 PSI.

4. Low pressure sensor will be set at 1060 PSI.

BP EXPLORATION PLATFORM "A"
VIOSCA KNOLL AREA
BLOCK 989

BP Exploration,
Inc.

Viosca Knoll 989 Oil Export Pipeline

<table>
<thead>
<tr>
<th>Prepared by</th>
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<th>Date</th>
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<th>Rev.No.</th>
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<tbody>
<tr>
<td></td>
<td>Pipeline System - Safety Schematic</td>
<td>0</td>
</tr>
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</table>
1. **LINE PIPE SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>O.D.</th>
<th>W.T.</th>
<th>GRADE</th>
<th>LENGTH</th>
<th>MAOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.750&quot;</td>
<td>0.562&quot;</td>
<td>API 5L-X60</td>
<td>32,273.0'</td>
<td>1440 psig</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td>API 5L-X60</td>
<td>25,235.2'</td>
<td>1440 psig</td>
</tr>
</tbody>
</table>

2. **RISER PIPE SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>O.D.</th>
<th>W.T.</th>
<th>GRADE</th>
<th>MAOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.750&quot;</td>
<td>0.562&quot;</td>
<td>API 5L-X60</td>
<td>1440 psig</td>
</tr>
</tbody>
</table>

3. **LINE PIPE COATING:**

   a. 14-16 mil Fusion Bonded Epoxy
   b. 14-16 mil Fusion Bonded Epoxy and 1 inch 140 pcf Concrete

4. **EXISTING SHELL PIPELINE:**

<table>
<thead>
<tr>
<th>O.D.</th>
<th>W.T.</th>
<th>GRADE</th>
<th>MAOP</th>
<th>MOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.750&quot;</td>
<td>0.406&quot;</td>
<td>API 5L-X56</td>
<td>1440 psig</td>
<td>1000 psig</td>
</tr>
</tbody>
</table>

5. **NAME OF PRODUCT:** Oil

6. **CLASS LOCATION:** Class I

7. **GOVERNING CODE:** Part 195, Title 49, of the Code of Federal Regulations

8. All coordinates shown are based on the Universal Transverse Mercator Plane Coordinate System, Zone 16.

9. Sand/cement and sand bags will be used to obtain 3' minimum cover for valves at tie-in.

10. **HYDROTEST:**

    | LOCATION                     | TEST MEDIUM     | PRESSURE | LENGTH |
    |-------------------------------|-----------------|----------|--------|
    | Tie-In Spools (Pre-Fabricated)| Fresh Water     | 2160 psig| 8 hours|
    | Pipeline (In Place)           | Filtered Sea Water | 2160 psig| 8 hours|
    | Riser (In Place)              | Filtered Sea Water | 2160 psig| 8 hours|

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**BP Exploration, Inc.**

**Viosca Knoll 989 Oil Export Pipeline**

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</tr>
</thead>
</table>

**Prepared by**

**Hudson Engineering Corp**

**Drawing Title**

Pipeline System - Specifications

**Rev. No.** 0
PROFILE

Scale: Hor. 1" = 2000'
Vert. 1" = 500'

BP Exploration, Inc.

Viosca Knoll 989 Oil Export Pipeline

Prepared by
Hudson Engineering Corp.
Houston, Texas

Water Line (El. 0)

Proposed 12" Oil Pipeline

Existing Shell 12" Oil Pipeline

STA. 550+00.0'

Water Depth 380 feet

Mudline

STA. 440+00.0'

Water Depth 620 feet

STA. 575+08.2'

Water Line (El. 0)

Water Depth 354 feet

Mudline

STA. 550+00.0'

Water Depth 380 feet
3. Valves and Flanges

a. All valves and flanges below water will be ANSI 900 Series, with a rated working pressure of 2,220 pounds per square inch (PSI) at 100 degrees Fahrenheit and less, and 2,181 PSI at 120 degrees Fahrenheit in accordance with ANSI B16.5 Code.

b. All valves and flanges above water will be ANSI 600 Series, with a rated working pressure of 1,480 pounds per square inch (PSI) at 100 degrees Fahrenheit and less, and 1,453 PSI at 120 degrees Fahrenheit in accordance with ANSI B16.5 Code.

4. The specific gravity of the product being transported is anticipated to be 0.8658 (water = 1.0) at 60 degrees Fahrenheit and 14.7 PSIG pressure.

5. Weight, type, and spacing of anodes to be used as corrosion protection are shown on attached Drawing Number AX-9210. The life expectancy of the proposed pipeline is 30 years, and the sacrificial anodes are designed for a 30-year life.

6. The design of the proposed pipeline is in accordance with the “Minimum Federal Safety Standards (Department of Transportation) Title 49 CFR Part 192”.

7. Maximum Allowable Operating Pressure (M.A.O.P.) = 1,440 PSI

   Maximum Capacity: Design Capacity = 40 MBbl / day

   Maximum Operating Pressure: High Sensor Setting = 1,360 PSI

   Minimum Operating Pressure: Low Sensor Setting = 1,060 PSI

   See attached calculations.

8. The production facilities are rated for 1,440 PSIG working pressure.

9. The existing 12-inch Shell Oil Company pipeline that the proposed line will tie into has an assigned M.A.O.P. of 1,440 PSI.
ALLOWABLE PRESSURE CALCULATIONS FOR
12-INCH OIL PIPELINE

Formulae:

\[ P = \frac{2st/d}{d} \]

\[ M.A.O.P. = 2st(F)(E)(T)/d \]

where: \( P \) = 100 percent S.M.Y.S.
\( s \) = Specified Minimum Yield Strength (S.M.Y.S.)
\( t \) = Nominal Wall Thickness in Inches
\( d \) = Nominal Outside Diameter in Inches
\( F \) = 0.60 for Riser Pipe
0.72 for Line and Subsea Tie-In Assembly Pipe
(as per Title 49, CFR, Part 195.106)
\( E \) = 1 for seamless pipe
\( T \) = 1 for temperature less than 250 degrees Fahrenheit

All pipe is seamless, API 5L-X60, with an S.M.Y.S. of 60,000 PSI.

Design temperature is 120 degrees Fahrenheit.

a. Riser Pipe - 12.750-inch O.D. X 0.562-inch W.T.

\[ P = \frac{(60,000 \text{ PSI})(0.562\text{\"})}{(12.750\text{\"})} = 5,289.4 \text{ PSI} \]

(1) M.A.O.P. (Design)

\[ M.A.O.P. = \frac{(2)(0.562\text{\"})}{(60000 \text{ PSI})(0.60)(1)(1)}{(12.750\text{\"})} \]

= 3,173.6 PSI

(2) M.A.O.P. (Hydrostatic Test Pressure - H.T.P.)

H.T.P. will be 2,160 PSIG for 8 hours. Test factor is 1.25 per Title 49, CFR, Part 195.302.

\[ M.A.O.P. = \frac{2,160 \text{ PSI}}{1.25} = 1,728 \text{ PSI} \]

(3) M.A.O.P. = 1,728 PSI per H.T.P. criteria.
b. Deep Water Line Pipe - 12.750-inch O.D. X 0.562-inch W.T.

\[ P = \frac{2(60,000 \text{ PSI})(0.562'')}{(12.750'')} = 5,289.4 \text{ PSI} \]

(1) M.A.O.P. (Design)

\[ \text{M.A.O.P.} = \frac{(2)(0.562')(60000 \text{ PSI})(0.72)(1)(1)}{(12.750'')} = 3,808.4 \text{ PSI} \]

(2) M.A.O.P. (Hydrostatic Test Pressure - H.T.P.)

H.T.P. will be 2,160 PSIG for 8 hours. Test factor is 1.25 per Title 49, CFR, Part 195.302.

M.A.O.P. = 2,160 PSI / 1.25 = 1,728 PSI

(3) M.A.O.P. = 1,728 PSI per H.T.P. criteria.

c. Shallow Water Line Pipe and Subsea Tie-In Assembly Pipe - 12.750-inch O.D. X 0.438-inch W.T.

\[ P = \frac{2(60,000 \text{ PSI})(0.438'')}{(12.750'')} = 4,122.4 \text{ PSI} \]

(1) M.A.O.P. (Design)

\[ \text{M.A.O.P.} = \frac{(2)(0.438')(60000 \text{ PSI})(0.72)(1)(1)}{(12.750'')} = 2,968.1 \text{ PSI} \]

(2) M.A.O.P. (Hydrostatic Test Pressure - H.T.P.)

H.T.P. will be 2,160 PSIG for 8 hours. Test factor is 1.25 per Title 49, CFR, Part 192.619.

M.A.O.P. = 2,160 PSI / 1.25 = 1,728 PSI

(3) M.A.O.P. = 1,728 PSI per H.T.P. criteria.

The M.A.O.P. is restricted to 1,440 PSI based on the M.A.O.P. of the pipeline that the proposed line will tie into.