Failure Investigation Report – Columbia Seneca Compressor Gas Venting – Activity ID 128518

Principal Investigator	David Hippchen WV PSC
Regional Director	Byron Coy
Date of Report	03/03/2011
Subject	Failure Investigation Report – Columbia Seneca Compressor Gas Venting

Summary:

Early on the morning of April 4, 2009, the grid power to the Seneca Compressor Station was momentarily interrupted. The loss of power caused two electrically driven air compressors that supplied instrument and safety system air to a new compressor building to drop off line and stay off line until manually reset. The station was unmanned at the time, and no personnel were available to reset the power. The air pressure continued to drop until the lack of balancing pressure triggered a building shutdown for Units 5 & 6. The building shutdown system vented gas at three locations, but the block valves did not isolate the building from working line pressure. Gas continued to vent until about 7:40 AM, when Columbia Gas personnel arrived at the station

Operator, Location, & Consequences

Date & Time of Failure:	April 4, 2009, 5:00 AM
Commodity Released:	Natural Gas
City/County & State:	Seneca Rocks, Pendleton County, WV
OpID & Operator Name	2616 Columbia Gas Transmission
Unit # & Unit Name	67791 WB System Seneca Compressor
SMART Activity #:	128518
Milepost / Location	Latitude 38.8813
	Longitude: -79.3762
Type of Failure:	Gas Venting
Fatalities:	0
Injuries	0
Description of area impacted	Rural
Property damage / gas loss	$101,335

System Details

Seneca Compressor Station

Events Leading up to the Failure

At approximately 2:40 AM on the morning of April 4 the purchased electrical power at Seneca CS dropped off for an instant. One result of this brief power interruption was the loss of the service of the two electric driven air compressors used to supply instrument air pressure to the new compressor equipment. For approximately 2 hours and 20 minutes (from the time of the power interruption until 5:00 AM) the instrument air pressure slowly leaked down from 105 psi to approximately 10 psi at which point the springs in the valve actuators drove the vent valves open.

Emergency Response

Columbia Gas personnel responded several hours after the venting started and isolated the system.

Summary of initial start-up plan and return-to-service, including preliminary safety measures

The Columbia Gas root cause analysis identified the following improvements that were implemented.

1. Modify the electrical control for the new air compressors to allow the units to remain on during brief power interruption.
2. Enable station alarms to alert Monitoring Center of low air pressure condition.
3. Open valve to allow both safety air systems to work together.
4. Modify electrical control on air systems to interlock block valve / blowdown valve combination.

Investigation Findings & Contributing Factors

Five causal factors contributed to this incident.

1. The loss of service of the new air compressors
2. No alarms were sent to the Monitoring Center upon loss of new air compressor service or for low instrument air pressure
3. There was no backup supply of pressurized instrument air to the new facilities
4. The block valves associated with the new building shutdown system were not equipped with spring loaded actuators
5. The building shutdown vent valves were not interlocked with the building shutdown block valves.

Appendices

1	Email Notification 901801
2	Incident Report 20090041-7021
3	Root Cause Analysis
4	NRC Report 901801
5	Map

128518 Appendix 1 - Email Notification 901801

Hippchen, David

From: dino.rathod@dot.gov
Sent: Monday, April 06, 2009 6:42 AM
To: Hippchen, David
Cc: stephen.gliebe@dot.gov; Mike.Yazemboski@dot.gov
Subject: FW: NRC#901801: Release of natural gas from transmission pipeline in Charleston, WV

I e-mailed you earleir during the weeeknd thru my Blackberry. Please review and follow-up. I will appreciate your e-mail update

Dino N. Rathod, P.E.
State Liaison Rep-Eastern Region
Pipeline & Hazardous Materials Safety Administration
U S Dept of Transportation
Te:202-260-8505 (W)
202-368-5514 (cell)
e-mail: dino.rathod@dot.gov

From: CMC-01 <OST>
Sent: Saturday, April 04, 2009 9:47 AM
To: PHP Accident/Incident Cadre <PHMSA>; PHMSA PHP100 EASTERN
Cc: CMC-01 <OST>; CMC-02 <OST>; Dick Gray; Golas, Gary <OST>; Plummer, Douglas <OST>; Powell, Winslow <OST>; Stuckey, William <OST>
Subject: NRC#901801: Release of natural gas from transmission pipeline in Charleston, WV

What: A caller is reporting that a compressor malfunctioned on a natural gas pipeline causing a release of an unknown quantity of natural gas into the atmosphere.

When: Charleston, WV

Where: 04-APR-09 at 07:30 local incident time

NATIONAL RESPONSE CENTER 1-800-424-8802
GOVERNMENT USE ONLYGOVERNMENT USE ONLY***
Information released to a third party shall comply with any applicable federal and/or state Freedom of Information and Privacy Laws

Incident Report # 901801

INCIDENT DESCRIPTION

*Report taken by: E4 NICHOLAS PROCKO at 08:58 on 04-APR-09
Incident Type: PIPELINE
Incident Cause: EQUIPMENT FAILURE
Affected Area:
Incident was discovered on 04-APR-09 at 07:30 local incident time.
Affected Medium: AIR INTO THE ATMOSPHERE

128518 Appendix 1 - Email Notification 901801

REPORTING PARTY

Name: MARY FRIEND
Organization: COLUMBIA GULF TRANSMISSION
Address: 1700 MACORKLE AVE
CHARLESTON, WV
COLUMBIA GULF TRANSMISSION reported for the responsible party.
PRIMARY Phone: (304)3895222
Type of Organization: PRIVATE ENTERPRISE

SUSPECTED RESPONSIBLE PARTY

Name: MARY FRIEND
Organization: COLUMBIA GULF TRANSMISSION
Address: 1700 MACORKLE AVE
CHARLESTON, WV
PRIMARY Phone: (304)3895222

INCIDENT LOCATION

1700 MACORKLE AVE County: PENDLETON
City: CHARLESTON State: WV

RELEASED MATERIAL(S)

CHRIS Code: ONG Official Material Name: NATURAL GAS
Also Known As:
Qty Released: 0 UNKNOWN AMOUNT

DESCRIPTION OF INCIDENT

THE CALLER IS REPORTING THAT A COMPRESSOR MALFUNCTIONED ON A NATURAL GAS PIPELINE CAUSING A RELEASE OF AN UNKNOWN QUANTITY OF NATURAL GAS INTO THE ATMOSPHERE.

SENSITIVE INFORMATION

INCIDENT DETAILS

Pipeline Type: TRANSMISSION
DOT Regulated: UNKNOWN
Pipeline Above/Below Ground: BELOW
Exposed or Under Water: NO
Pipeline Covered: UNKNOWN

IMPACT

Fire Involved: NO Fire Extinguished: UNKNOWN

INJURIES:	NO	Hospitalized:	Empl/Crew:	Passenger:
FATALITIES:	NO	Empl/Crew:	Passenger:	Occupant:
EVACUATIONS:	NO	Who Evacuated:	Radius/Area:	

Damages: NO

Closure Type	Description of Closure	Hours Closed	Direction of Closure
Air: N			
Road: N			Major Artery:N

N
Waterway:
N
Track:

Environmental Impact: UNKNOWN
Media Interest: NONE Community Impact due to Material:

REMEDIAL ACTIONS

THE STATION WAS SHUT-IN.
Release Secured: YES
Release Rate:
Estimated Release Duration:

WEATHER

Weather: CLEAR, °F

ADDITIONAL AGENCIES NOTIFIED

Federal: NONE
State/Local: NONE
State/Local On Scene: NONE
State Agency Number: NONE

NOTIFICATIONS BY NRC

ATLANTIC STRIKE TEAM (MAIN OFFICE)
04-APR-09 09:05 (609)7240008
USCG ICC (ICC ONI)
04-APR-09 09:05 (301)6693363
CG INVESTIGATIVE SERVICE BALTIMORE (MAIN OFFICE)
04-APR-09 09:05 (410)5762555
INFO FOR CRITICAL MFG SECTOR (MAIN OFFICE)
04-APR-09 09:05 (703)2353049
DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)
04-APR-09 09:05 (202)3661863
U.S. EPA III (MAIN OFFICE)
(215)8149016
NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)
04-APR-09 09:05 (202)2829201
NOAA RPTS FOR WV (MAIN OFFICE)
04-APR-09 09:05 (206)5264911
SECTOR OHIO VALLEY (COMMAND CENTER)
04-APR-09 09:05 (502)7795422
VA DEPT EMERGENCY MANANGEMENT (MAIN OFFICE)
04-APR-09 09:05 (804)6742400
WEST VIRGINIA DEP (MAIN OFFICE)
04-APR-09 09:05 (304)5585938
WV DEP ATTN: DUTY OFFICER (MAIN OFFICE)
04-APR-09 09:05 (800)6423074
WV DEP SPILL LINE (MAIN OFFICE)
04-APR-09 09:05 (304)3683960

ADDITIONAL INFORMATION

THE CALLER HAD NO ADDITIONAL INFORMATION.

*** END INCIDENT REPORT #901801 ***
Report any problems by calling 1-800-424-8802
PLEASE VISIT OUR WEB SITE AT http://www.nrc.uscg.mil

U.S Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

INCIDENT REPORT – GAS TRANSMISSION AND GATHERING SYSTEMS

Report format corresponds to Form PHMSA F 7100.2 (01-2002)

Report Date April 28, 2009

No. 20090041 - 7021

PART A – GENERAL INFORMATION

N	Original Report	Y	Supplemental Report	Y	Final Report

1. Operator Name and Address	
a. Operator's 5-digit Identification Number	2616
b. If Operator does not own the pipeline, enter Owner's 5-digit Identification Number (when known)	
c. Name of Operator	COLUMBIA GAS TRANSMISSION CORP
d. Operator street address	1700 MACCORKLE AVE SE
e. Operator address City	CHARLESTON
County or Parish	KANAWHA
State	WV
Zip code	25314
2. Time and date of the incident	
Hour	07:12
Date of the incident	4/4/2009
3. Location of incident	
a. Street or nearest street or road	RT 28
b. City	SENECA ROCKS
County or Parish	PENDLETON
c. State	WV
Zip Code	26884
d. Mile Post/Valve Station	SENECA COMPRESSOR STATION
e. Survey Station No	
f. Latitude	38.8813
Longitude	-79.3762
g. Class location description	
Onshore (Class Location)	1
Offshore	N
Area	
Block #	
State	
Outer Continental Shelf	N
h. Accident on Federal Land other than Outer Continental Shelf	N
i. Is pipeline Interstate	Y
4. Type of leak or rupture	
Leak or Rupture	OTHER
Type of Leak	
- Puncture, diameter *(inches)*	
Type of Rupture	
- Tear/Crack, length *(inches)*	
- Propagation Length, total, both sides *(feet)*	
Other (specify)	COMPRESSOR STATION BUILDING BLOW DOWN
5. Consequences	
a. Fatality	No
Total number of people	0
Employees	0
General Public	0
Non-employee Contractors	0
b. Injury requiring inpatient hospitalization	No
Total number of people	0

1

Employees	0
General Public	0
Non-employee Contractors	0
c. Property damage/loss (estimated)	Yes
Total $	101,335
Gas loss $	101,335
Operator damage $	0
Public/private property damage $	0
d. Release Occurred in a 'High Consequence Area'	N
e. Gas Ignited / Gas did not ignite	Gas did not Ignite
f. Explosion / No Explosion	NO EXPLOSION
g. Evacuation *(general public only)*	N
Number of people	0
Evacuation Reason	
6. Elapsed time until area was made safe	
Hours	2
Minutes	40
7. Telephone Report	
NRC Report Number	901801
Date	4/4/2009
8. Pressure	
a. Estimated pressure at point and time of incident (*PSIG)*	731.00
b. Max. allowable operating pressure (MAOP) (*PSIG)*	1000.00
c. MAOP established by 49 CFR section	49 CFR 192.619(a)(2)
d. Did an over pressurization occur relating to the incident?	N
PART B – PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	MARK NEWMAN
Preparer's Title	
Area Code and Telephone Number	3047228475
Preparer's E-mail Address	MNEWMAN@NISOURCE.COM
Area Code and Facsimile Number	3047228420
PART C – ORIGIN OF THE INCIDENT	
1. Incident occurred on	TRANSMISSION
2. Failure occurred on	OTHER
Other (specify)	LOST ELECTRICAL POWER
3. Material involved *(pipe, fitting, or other component)*	STEEL
Plastic failure was	
a. ductile	N
b. brittle	N
c. joint failure	N
Material other than plastic or steel	
4. Part of the system involved in incident	COMPRESSOR
Other (specify)	
5. Year the pipe or component which failed was installed	2008
PART D – MATERIAL SPECIFICATION	
1.Nominal pipe size (NPS) (inches)	
2. Wall thickness inches	
3. Specification	
SMYS	
4. Seam type	
5. Valve type	
6. Pipe or valve manufactured by	
in year	
PART E - ENVIRONMENT	
1. Area of incident	OTHER
Other (specify)	COMPRESSOR STATION

2

Depth of cover (inches)	
PART F – APPARENT CAUSE	
F1 – CORROSION	
1. External Corrosion	
2. Internal Corrosion	
Complete items a-e where applicable	
a. Pipe Coating	
b. Visual Examination	
Other (specify)	
c. Cause of Corrosion	
Other (specify)	
d. Was corroded part of pipeline considered to be under cathodic protection prior to discovering incident?	
Year Protection Started	
e. Was pipe previously damaged in the area of corrosion?	
How long prior to incident? Years	
Months	
F2 – NATURAL FORCES	
3. Earth Movement	
Description	
Other (specify)	
4. Lightning	
5. Heavy Rains/Floods	
Description	
Other (specify)	
6. Temperature	
Description	
Other (specify)	
7. High Winds	
F3 - EXCAVATION	
8. Operator Excavation Damage (including their contractors) / Not Third Party	
9. Third Party Excavation Damage	
a. Excavator group	
b. Type	
Other (specify)	
c. Did operator get prior notification of excavation activity?	
Date received	mo. ___ day ___ yr.
Notification received from	
d. Was pipeline marked?	
Temporary markings	
Permanent markings	
Marks were	
Were marks made within required time?	
F4 – OTHER OUTSIDE FORCE DAMAGE	
10. Fire/Explosion as primary cause of failure	
Description	
11. Car, truck or other vehicle not relating to excavation activity damaging pipe	
12. Rupture of Previously Damaged Pipe	
13. Vandalism	
F5 – MATERIAL AND WELDS	
Material	
14. Body of Pipe	
Description	
Other (specify)	
15. Component	
Description	
Other (specify)	

16. Joint	
Description	
Other (specify)	
Weld	
17. Butt	
Description	
Other (specify)	
18. Fillet	
Description	
Other (specify)	
19. Pipe Seam	
Description	
Other (specify)	
Complete a-g if you indicate any cause in part F5	
a. Type of failure	
Construction Defect	NO DATA
Description	
Material Defect	NO DATA
b. Was failure due to pipe damage sustained in transportation to the construction or fabrication site?	
c. Was part which leaked pressure tested before incident occurred?	
d. Date of test	
Month	
Day	
Year	
e. Test medium	
Other (specify)	
f. Time held at test pressure hr	
g. Estimated test pressure at point of incident (PSIG)	
F6 – EQUIPMENT AND OPERATIONS	
20. Malfunction of Control/Relief Equipment	Yes
Description	OTHER
Other (specify)	COMPRESSOR STATION BUILDING BLOW DOWN
21. Threads Stripped, Broken Pipe Coupling	
Description	
Other (specify)	
22. Ruptured or Leaking Seal/Pump Packing	
23. Incorrect Operation	
a. Type	
Other (specify)	
b. Number of employees involved who failed post-incident test	
Drug test	
Alcohol test	
c. Were most senior employee(s) involved qualified?	
d. Hours on duty	
F7 – OTHER	
24. Miscellaneous	
Description	
25. Unknown	
Description	

PART G – NARRATIVE DESCRIPTION OF FACTORS CONTRIBUTING TO THE EVENT

DURING THE NIGHT, THE COMMERCIAL POWER TO THE STATION WAS BRIEFLY INTERRUPTED. THE POWER LOSS CAUSED THE AIR COMPRESSORS TO TURN OFF. DUE TO A SLOW LEAK SLOW LEAK, THE PRESSURE FELL ON THE AIR SYSTEM, AT WHICH POINT THE VENT VALVES OPENED, BLOWING DOWN ONE COMPRESSOR BUILDING AND THE ASSOCIATED FUEL GAS SYSTEM. CONTROLS TO AIR COMPRESSOR HAVE BEEN MODIFIED TO ALLOW UNITS TO STAY ON DURING BRIEF INTERRUPTIONS IN ELECTRIC POWER. COLUMBIA'S MONITORING CENTER IS ALSO NOW

ABLE TO MONITOR STATION AIR PRESSURE WHICH IS USED TO ACTIVATE THE STATION ESD SYSTEM.

5

Appendix 3 Root Cause Analysis

Columbia Gas Transmission Root Cause Analysis

This document is on file at PHMSA

128518 Appendix 4 - NRC Report 901801

PHMSA Pipeline & Hazardous Materials Safety Administration

HMIS->INCIDENTS->TELEPHONICS

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<< Previous 1..1 of 1 << Save >>

☐ Rescinded **Comments** (max 250 characters)

NRC Number: 901801
Call Date: 04/04/2009 **Call Time:** 08:58:59

Caller Information

First Name:	MARY	Last Name:	FRIEND
Company Name:	COLUMBIA GULF TRANSMISSION		
Address:	1700 MACORKLE AVE		
City:	CHARLESTON	State:	WV
Country:	USA	Zip:	
Phone 1:	3043895222	Phone 2:	
Organization Type:	PRIVA	Is caller the spiller?	◉ Yes ○ No ○ No Response
Confidential:	○ Yes ◉ No ○ No Response		

Discharger Information

First Name:	MARY	Last Name:	FRIEND
Company Name:	COLUMBIA GULF TRANSMISSION		
Address:	1700 MACORKLE AVE		
City:	CHARLESTON	State:	WV
Country:	USA	Zip:	
Phone 1:	3043895222	Phone 2:	
Organization Type:	PRIVA		

Spill Information

State:	WV	County:	PENDLETON
Nearest City:	CHARLESTON	Zip Code:	

Location

1700 MACORKLE AVE

Spill Date:	04/04/2009 (mm/dd/yyyy)	Spill Time:	07:30:00 (24hh:mm:ss)
DTG Type:	DISCOVERED		
Incident Type	PIPELINE	Reported Incident Type	PIPELINE

128518 Appendix 4 - NRC Report 901801

Description

THE CALLER IS REPORTING THAT A COMPRESSOR MALFUNCTIONED ON A NATURAL GAS PIPELINE CAUSING A RELEASE OF AN UNKNOWN QUANTITY OF NATURAL GAS INTO THE ATMOSPHERE.

Materials Involved

Material / Chris Name	Chris Code	Total Qty.	Water Qty.
NATURAL GAS	ONG	0 UNKNOWN AMOUNT	

Medium Type: AIR

Additional Medium Information:

INTO THE ATMOSPHERE

Injuries: Fatalites:

Evacuations: ○ Yes ◉ No ○ Unknown No. of Evacuations:

Damages: ○ Yes ◉ No ○ Unknown Damage Amount:

Federal Agency Notified: ○ Yes ○ No ◉ Unknown State Agency Notified: ○ Yes ○ No ◉ Unknown

Other Agency Notified: ○ Yes ○ No ◉ Unknown

Remedial Actions

THE STATION WAS SHUT-IN.

Additional Info

THE CALLER HAD NO ADDITIONAL INFORMATION.

Latitude

Degrees: Minutes: Seconds: Quadrant:

Longitude

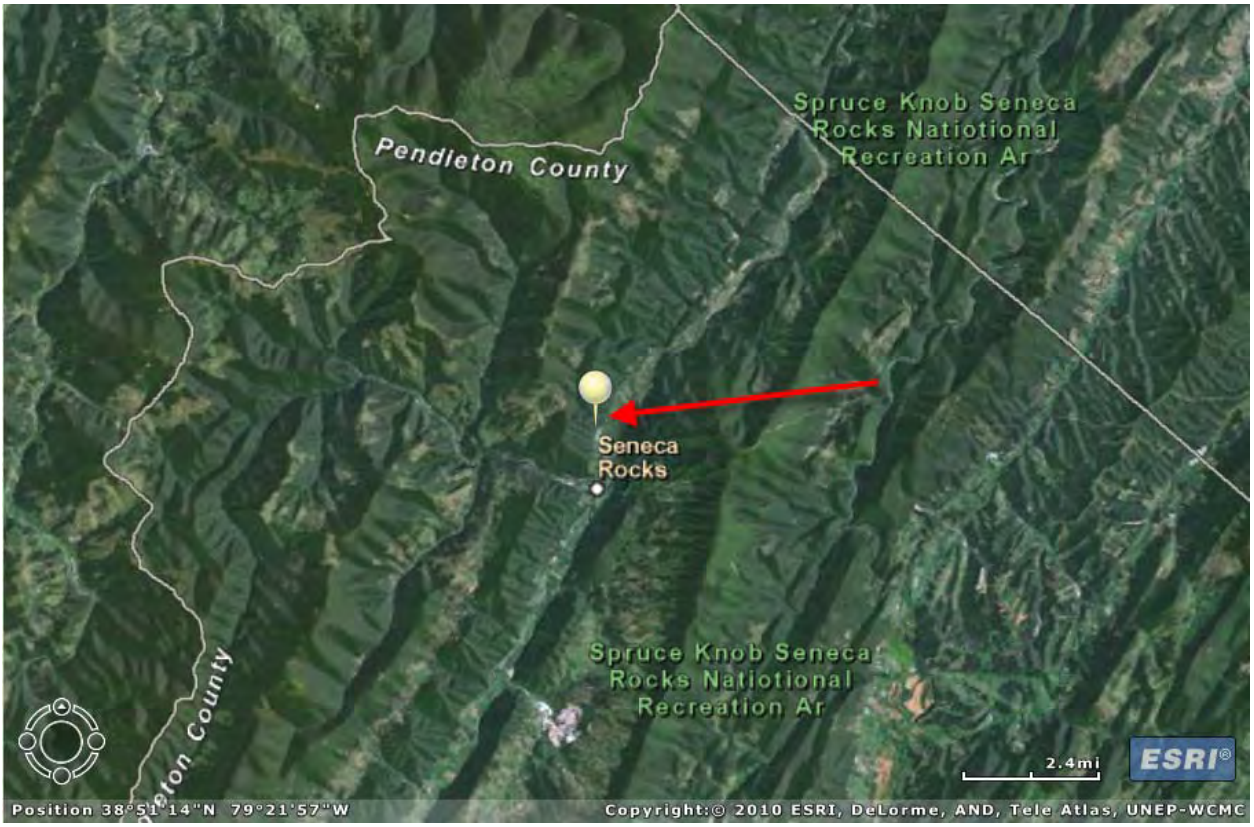
Degrees: Minutes: Seconds: Quadrant:

Distance from City: Direction:

Section: Township:

Range: Milepost:


Spruce Knob
Seneca Rocks Natiotional
Recreation Ar
28
33
Pendleton County
Seneca Compressor Station
Seneca Rocks
Spruce Knob Seneca
Rocks Natiotional
Recreation Ar
2.4mi
ESRI
Position 38°51'14"N 79°21'57"W
Source: NASA, NGA, USGS


Spruce Knob Seneca
Rocks Natiotional
Recreation Ar
Pendleton County
Seneca
Rocks
Spruce Knob Seneca
Rocks Natiotional
Recreation Ar
2.4mi
ESRI
Position 38°51'14"N 79°21'57"W
Copyright:© 2010 ESRI, DeLorme, AND, Tele Atlas, UNEP-WCMC


396ft
ESRI
Position 38°50'56"N 79°22'31"W
Source: NASA, NGA, USGS