

Plastic Material Issues Relevant to DIMP

Brian Moidel
Past AGA PMC Chairman
January 21, 2010



Issues to be discussed

1. Plastic Pipe Database (PPDC)
2. PHMSA Advisory Bulletin
3. DIMP Rule
4. AGA PMC Compression Fitting Database
5. AGA PMC Plastic Pipe Integrity Management Library

Plastic Pipe Database Comm. (PPDC)

Members Include:

- PHMSA (Federal Regulators)
- NAPSAR (State Regulators)
- NARUC (State Commissioners)
- AGA (Industry)
- APGA (Industry)
- PPI (Plastic Pipe Industry)

Plastic Pipe Database Comm. (PPDC)

Goals:

- Create National Dbase of in-service performance
- Collect Accurate and Pertinent information
- Analyze the “Frequency” and “Cause” of failures

Plastic Pipe Database Comm. (PPDC)

Program:

- A Voluntary Confidential Program
- Data Collection Should Not Be Burdensome
- Data Submission To Be Easy
- Use of the Information

Plastic Pipe Database Comm. Volunteer Form



COUNT ME IN AS A PPDC VOLUNTEER

If your Company is willing to participate in the Plastic Pipe Data Committee's Voluntary Data Collection Project, please have the appropriate person provide the requested information and sign below.

Please return this form to the attention of Kate Miller, AGA's Manager Engineering Services. The data submitted by your company will be held in confidence, but AGA may report to the PPDC that you are a participant.*

Name of Corporation: _____

Yes, I'll Participate:

PPDC FAQs

Q. What types of failures are reportable under the PPDC initiative?

- Only report plastic material failures of in-service pipe, fittings or joints (this includes installation errors that fail after the pipe is put in service).
- Do not report failures of piping before the piping is put into service.
- Report failures of any kind of plastic piping material.
- Report only failures where the plastic pipe, fitting, or joint has experienced failure through the wall, body or shell of the plastic component.

PPDC FAQs

Q. Do I report a failure of a metallic fitting used on a plastic line?

A. Yes, this information provides valuable information about fittings used on plastic piping systems.

Q. If I have an incident that is under investigation by my company, the Federal or the State Government, when should I send in my information to the PPDC?

A. Companies should wait to submit plastic material failure information to the PPDC when a failure is still under investigation. The company can submit the failure information once the cause of the failure has been determined.

Plastic Pipe Database Comm. Negative Report Form

Ms Kate Miller
Manager Engineering Services
American Gas Association
400 N. Capitol Street, N.W.
Washington, D.C. 20001

Phone: (202) 824-7342 Fax: (202) 824-7136

Re: Plastic Piping Data Collection Project -- Negative Report

This is to report that for the 1-month period ending on _____, no plastic piping material failures occurred in our system.

Name (Print): _____

Plastic Pipe Database Comm. Failure Report Form

MATERIALS SECTION		FAILURE ANALYSIS SECTION	
PLASTIC PIPE OR FITTING		FAILURE	
1 IDENTIFICATION (Check one for Type of Material)		7a LOCATION	
TYPE OF MATERIAL	OTHER SPECIFICATIONS:		PIPE
ABS	MANUFACTURER:		FITTING (Complete 7b)
CAB			JOINT (Complete 7c)
HDPE - 3306	PRINT	FAILURE IN	
HDPE - 3406	LINE:	7b FITTING (Check as applies)	
HDPE - 3408			TRANSITION
MDPE - 2306	(Circle one and enter value below)		VALVE (PLASTIC)
MDPE - 2406	SDR, DR, SCHEDULE or		METER RISER
PB	WALL THICKNESS:		MECHANICAL FITTING
PVC			HEAT FUSION FITTING
OTHER(Describe):	NOMINAL		ELECTROFUSION FITTING
	SIZE:		OTHER(Describe):
2 DATE OF MANUFACTURE		FAILURE IN	
		7c JOINT (Check as applies)	
INSTALLATION AND OPERATIONS SECTION			MECHANICAL
METHOD OF INSTALLATION (Check One)	TYPE OF SOIL IN CONTACT W/ PIPE (Check One)		ELECTROFUSION
OPEN TRENCH	4		BUTT FUSION
BORED	SAND		SOCKET FUSION
PLOWED IN	LOAM		SADDLE FUSION
INSERTION	CLAY		SOLVENT
JOINT TRENCH	ROCKY		OTHER(Describe):
PLANTED	SLURRY		
UNKNOWN	OTHER(Describe):	FAILURE	
OTHER(Describe):		8 CAUSE (Check all that apply)	
			SQUEEZE OFF
			POINT LOADING
			EXCESSIVE EXPANSION

Plastic Pipe Database Comm. Failure Report Definitions

DOT PLASTIC PIPE DATA-SHARING INITIATIVE

DEFINITIONS

Clarification of Data to Be Collected in The Plastic Piping Failure Report Form

1) Plastic pipe or fitting identification

This is the plastic material that the pipe or fitting is made from. Typical materials are Polyethylene (PE), Polyvinyl Chloride (PVC), or Polyamide (PA). A two or three letter designation may be on the print line of the pipe or fitting or be available in company records.

a) Type of Material

The letter code indicating the material which the pipe is made from such as PE, PVC, or PA. If type of material is unknown, indicate color (For example, tan, orange, yellow, black, black-yellow, white-blue).

PPDC Instructions

Failure Analysis Section 7:

Mechanical fitting - The failure occurred within the body of a mechanical fitting. This includes stab type, screw on, bolt on, and mechanical tapping tees made of metal and plastic. This will include both pullout-proof and seal only types but does not include plastic-to-steel couplings, they are considered transition fittings. This would only apply to failures in the bodies of mechanical fittings and not failures in the joints between the fittings and pipe.

PPDC Instructions

Failure Analysis Section 7: (cont'd)

Transition Fitting - The failure was at a plastic-to-steel transition fitting. This includes both mechanical pullout-proof metal and plastic couplings and factory produced weld-in and fuse-in transition fittings.

Plastic Pipe Database Comm. Annual Report



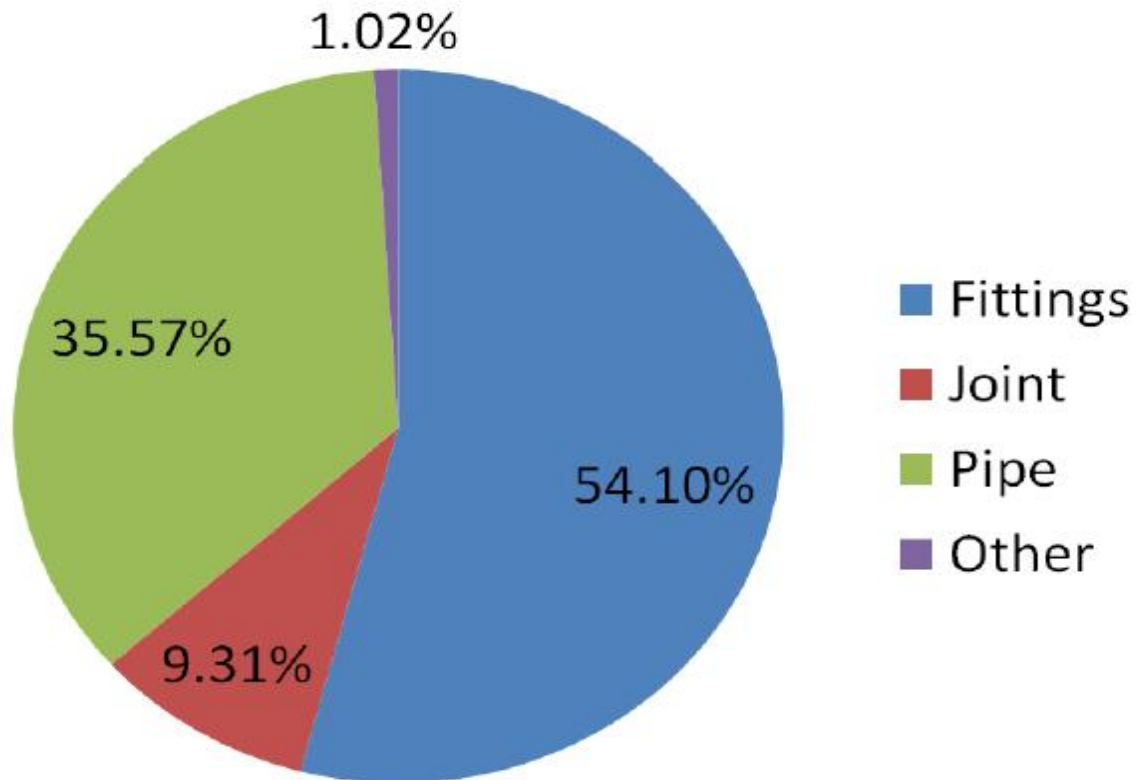
PLASTIC PIPING DATA COLLECTION INITIATIVE STATUS REPORT

April 30, 2009

PPDC Annual Report

Appendix A

PE Failures by Component



PPDC Annual Report

Historical Problems:

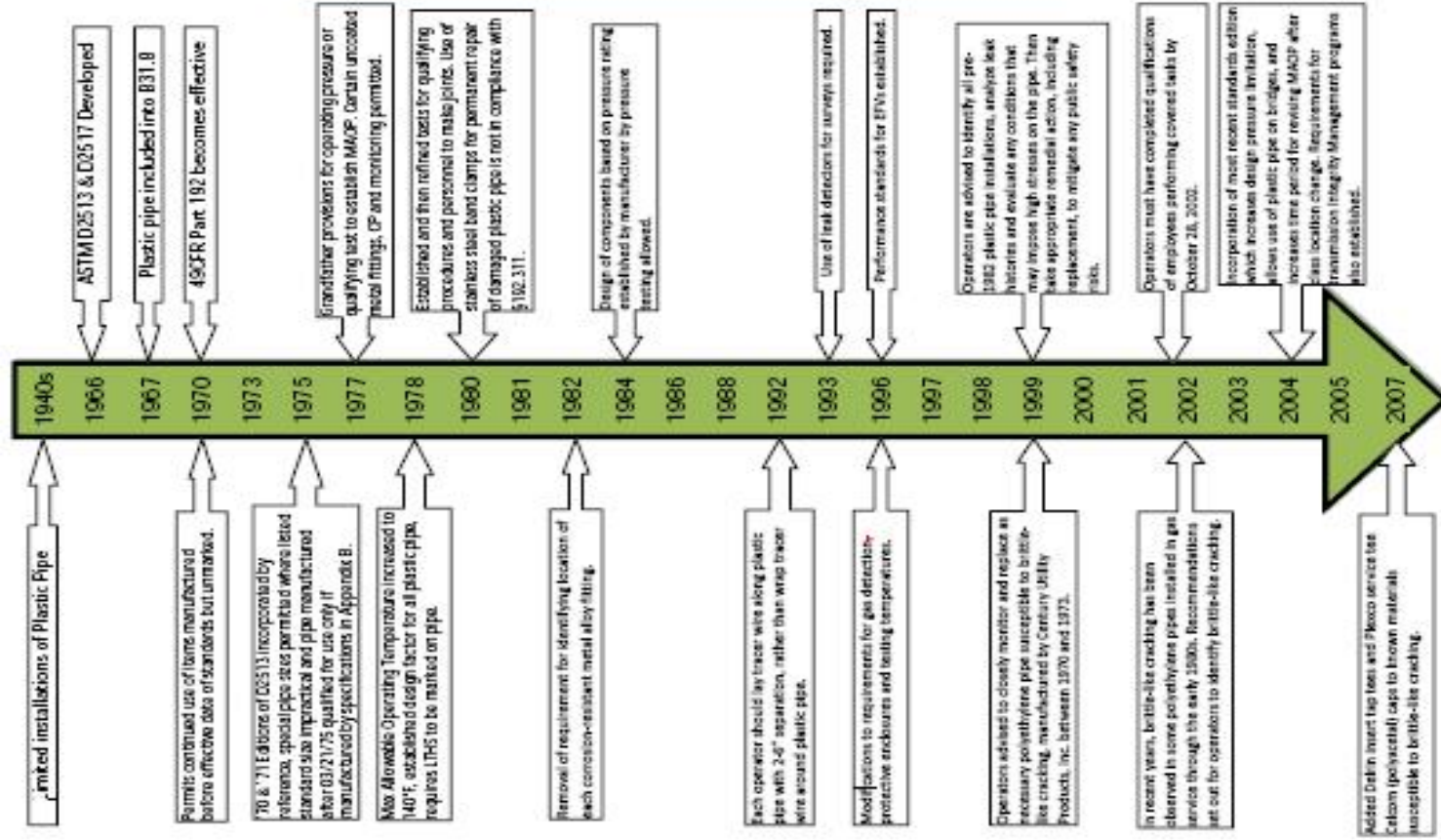
1. **Century Utility Products** polyethylene (PE) pipe produced from 1970 - 1974
2. **DuPont Aldyl®** A low ductile inner wall PE pipe manufactured from 1970 through 1972
3. PE pipe manufactured from PE 3306 resin such as **Swanson, Orangeburg and Yardley**
4. **DuPont Aldyl®** service punch tee with a white Delrin® polyacetal threaded insert
5. **Plexco** service tee with Celcon® polyacetal cap

Plastic Manufacturers Chart

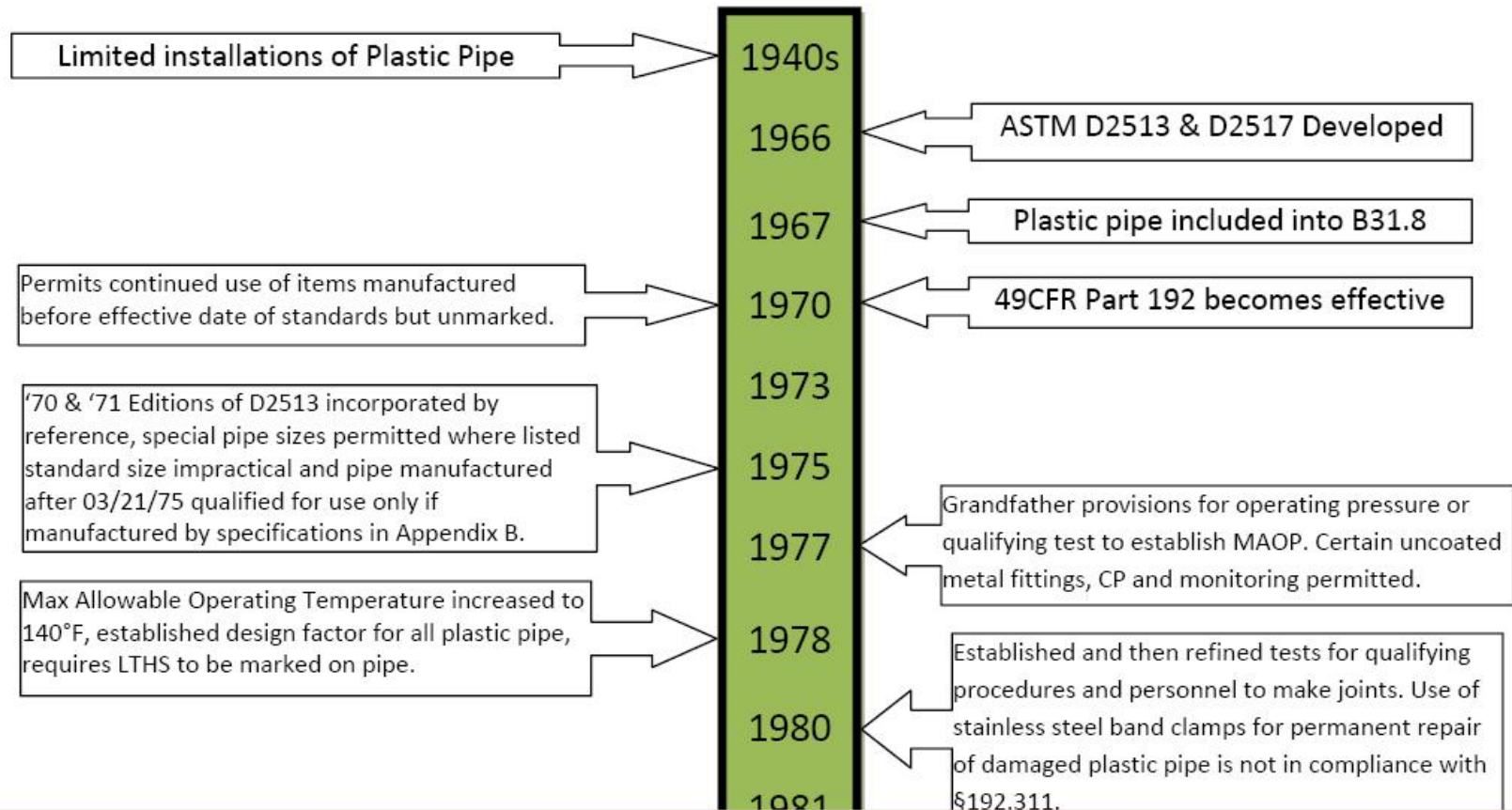
Company	Material Designation	From	To	Size Range	Comments
Allied	PE 3306/3406	1965/66	1972/73	1/2" CTS - 2" IPS	Was also a resin producer and supplied the AC ultra high molecular pipe compound to several small pipe extruders including Yardley, Orangeburg, Endot and the Barrett Division of Allied (also an extruder of PVC pipe). Except for Endot, most of these producers/extruders have since gone out of business or have different names today. Pipe was very difficult to fuse.
Celenese Pipe					Tubing manufacturer ultimately owned by Solvay
Century Pipe					Early 1970's (Tan)
	PE 2306	1970	1974	1/2" CTS - 4" IPS	
	PE 3306				
Charter Plastics	PE 2406/3408	1980s	present	1/2" CTS-6" IPS	Manufactured tubing and small pipe in MidAtlantic coast region.
Circle K					
Co-Ex Pipe	PE 2406/3408	1980s	present	1/2" CTS-6" IPS	Manufactured at West Texas location
Continental	PE2306	Mid-late 1970s			
CPChem Pipe					Chevron Phillips Chemical Company, LP. See Performance Pipe
Crescent	PE3306	Mid-late 1960s			

Plastic Pipe Timeline

PLASTIC PIPE TIMELINE



Plastic Pipe Timeline



PLASTI

AGA PPDC Website

[http://www.aga.org/Kc/resourcesbydiscipline/
OperationsEngineering/ppdc](http://www.aga.org/Kc/resourcesbydiscipline/OperationsEngineering/ppdc)

DIMP Final Rule

Compression Couplings

§192.1009 What must an operator report when compression couplings fail? (This proposed language may be affected by comments to DOT)


Each operator must report, on an annual basis, information related to failure of compression couplings, excluding those that result only in non-hazardous leaks, as part of the annual report required by §191.11 beginning with the report submitted March 15, 2011. This information must include, at a minimum, **location of the failure in the system, nominal pipe size, material type, nature of failure including any contribution of local pipeline environment, coupling manufacturer, lot number and date of manufacture, and other information that can be found in markings on the failed coupling.** An operator also must report this information to the state pipeline safety authority if a state exercises jurisdiction over the operator's pipeline.

DOT Annual Report

- Report data for each failure of a compression fitting that resulted in a hazardous leak during the calendar year.
- Report for 2010 in March 2011 report

Coupling Data for Annual Report

- Coupling manufacturer
- Model number
- Lot number
- Decade of manufacture
- Nominal pipe size
- Material type (body)
- Number of similar failures
- Nature of failure
 - Pullout
 - Elastomer failure
 - Body failure
- Location in system
 - Meter set
 - Riser joint
 - Service line
 - Service-to-main
 - Main
 - Other



DOT Advisory Bulletin

ADB-08-02

Subject - Identifying Issues with Mechanical Couplings that Could Lead to Failure.

Issued - March 4, 2008

Docket No. - PHMSA-RSPA-2004-19856

DOT Advisory Bulletin

ADB-08-02

Recommendations:

- (1) Review procedures for using mechanical couplings, including the coupling design and installation and ensure that they meet manufacturer's recommendations.
- (2) Review leak survey procedures to ensure that leak surveys are properly conducted, taking into account other contributing factors (i.e., weather conditions, calibration)

DOT Advisory Bulletin

ADB-08-02

Recommendations (cont'd):

- (3) Review personnel qualifications to ensure they address leak surveys sufficiently.

DOT Advisory Bulletin

ADB-08-02

PHMSA also advises operators to consider the following to reduce risk of failure:

1. Use Category 1 fittings only if mechanical couplings are used on pipe sizes 1/2" – 2".
2. Improve recordkeeping on specific couplings that exist in your system.
3. Consider whether to adopt a full replacement program if there are too many unknowns related to couplings in service.

ASTM D2513 Coupling Categorization

- Category 1- A mechanical joint design that provides a seal plus a resistance to a force on the pipe end equal to or greater than that which will cause a permanent deformation of the pipe.
- Category 2- A mechanical joint design that provides a seal only.
- Category 3- A mechanical joint design that provides a seal plus a pipe restraint rating equivalent to the anticipated thermal stresses occurring in a pipeline.

Compression Fitting Database

AGA PMC Project Scope:

AGA Plastic materials committee (PMC) task group is developing a database, similar to the PPDC database of "PE Pipe and Fitting Products", to categorize all compression fitting joints by fitting manufacturer, style, size range and time period.

P. Sheth – Chairman

F. Volgstadt – Vice Chairman

Compression Fitting Database

Program Objectives:

- Compile historical and current information for compression fittings used on natural gas distribution systems that will promote better understanding in recognizing the type and category for managing DIMP program.
- Obtain input from operators and manufacturers.
- Publish full PDF color photo catalog with search and sort features on AGA website for members access.
- Not intended to trend or track the performance of compression fittings.

Compression Fitting Definition

- PMC Task Group definition - A compression fitting includes nut follower design, bolted and hydraulic fittings. Stab type fittings are not included as there is no torque applied to tighten the fitting.

Catalog Content

- Manufacturer
- Fitting Type
- Compr. Ftg Definition
- Fitting Vintage
 - From & To
- Fitting Size
- Fitting Size Range
- Fitting Material
- Fitting Category
- Fitting End Connection
- Sealing Type
- Sealing Material
- Stiffener Material
- Stiffener Type

Compression Fitting Catalog

Mechanical Coupling Historical Catalog

Manufacturer: Chicago Fittings Corp.

Mfgr Model Num: 785 Series

Fitting Size: 1/2"CTS-1"CTS

Fitting Material: Bronze

Chicago Fittings Corp. 785 Series

Size: 1/2"CTS-1"CTS

Material: Bronze

Fitting Type Nut Follower
Fitting Size Range 1/2"CTS-1"CTS
Category Type 1
Joining End Connection PE to Steel, PE to Copper,
Copper to Copper
Vintage From (YEAR) 1970
VintageTo (YEAR) Current
Stiffener Material Metallic
Stiffener Type V-Groove

Sealing Type Gasket
Sealing Material Buna-N
Install Location Above/Below Ground
Fitting Definition C
Photo File Name 785 Series.jpg
Exploded Photo Filename
Comments Varoious Coatings Available
\\Dc-eng\Codes\



Fitting Material: Steel

Chicago Fittings Corp. 569 Series

Size: 1/2"CTS-1"CTS

Material: Steel

Fitting Type Nut Follower
Fitting Size Range 1/2"CTS-1"CTS
Category Type 1
Joining End Connection Copper to Steel
Vintage From (YEAR) 1970
VintageTo (YEAR) Current
Stiffener Material Metallic
Stiffener Type V-Groove

Sealing Type Gasket
Sealing Material Buna-N
Install Location Above/Below Ground
Fitting Definition A
Photo File Name 569 Series.jpg
Exploded Photo Filename
Comments Varoious Coatings Available
\\Dc-eng\Codes\



Compression Fitting Catalog

In addition the website would house:

- Library of Past Technical Articles
- Library of Past Technical Presentations
- Types of Fittings Produced

Compression Fitting Catalog

Website: Forthcoming

Plastic Pipe Integrity Management Library

#	Presentation/Paper Title	Author Last Name	Author's Company	Type of Document	Date of Document
001	QA Technology for Polyethylene Butt Fusion Joints	Craig	McElroy Manufacturing	PowerPoint	5/25/2006
003	Functional Integrity Assessment of Plastic Pipelines	Bryce	Jana Laboratories, Inc	PowerPoint	4/3/2008
004	New technologies may offer way to assess the integrity of plastic pipes and fittings in a non-destructive manner	Fabiano	NYSEARCH	Paper	6/5/2006
005A	Pinhole Leaks In Gas Service Risers Causing Meter Fires	Leslie	Boonville Natural Gas	Trade Journal Article	6/8/2006
006	Pipeline Data Management	Bryce	Jana Laboratories, Inc	PowerPoint	4/3/2008
008	Pipe Identification Brochure	Efthemes	Southwest Gas	Brochure	6/13/2006
009	Aldyl "A" and Century PE RPM Projections with Actual Field Performance	Palermo	Palermo Plastics Pipe (P3) Consulting	Technical Report	5/17/2006
010	Ensuring Long-Term Gas Distribution System Integrity by Performing Testing and Failure Analysis of Materials	Sheth	National Grid	Presentation	5/20/2009
011	Performance Testing for PE Materials Addresses Concerns of Operators	Fabiano	NYSEARCH	Presentation	5/20/2009
012A	Comprehensive Risk Model for Distribution Integrity Management	Beaver	Advantica	Presentation	5/21/2009
013	Key Strategies for Developing Distribution Integrity Management Plans	White Walker	Miller Consulting Services Inc.	Presentation	5/21/2009
014	Distribution Integrity Management for Plastic Gas Pipelines	Oliphant	Jana Laboratories, Inc	Presentation	5/21/2009
015	RCP	Palermo	Palermo (P3) Consulting	Presentation	9/29/2009



Plastic Pipe Integrity Management Library

Website: Forthcoming



The End