

SD/ND Pipeline Safety Operator Training



MidAmerican Energy Company's Approach to Risk Prioritization

March 15, 2011

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MEC Background:

- Serve natural gas to over 700,000 customers in Illinois, Iowa, Nebraska and South Dakota
- Over 12,000 miles of Distribution vs. 800 miles of Transmission
- Distribution system is composed of many materials due to age of system and previous company acquisitions/predecessors
 - ✦ Steel – bare, coated, protected and unprotected
 - ✦ Plastic – first and second generations
 - ✦ Cast Iron/Wrought Iron
 - ✦ Copper

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Today's Agenda:

- MidAmerican Energy Company (MEC's) DIMP Update
- Risk Prioritization Process
- Review of DIMP Pilot Audit w/PHMSA and State Regulators
- Questions

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Where is MEC at with DIMP?

- Written DIMP development
 - Reviewed by internal Advisory Team 7/15/10
 - Reviewed by Structural Integrity Associates 8/31/10
 - Pre-audit with PHMSA, ICC, IUB and SDPUC completed Nov. 11-15 at MEC's Urbandale, IA facility
 - Plan approved by Management on 12/27/10

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- Risk Model Development
 - Purchased software model
 - Model in operation – working on display of web app. mapping and hardware issues (i.e. moving from test to production)
 - Will use SME's to validate model and integrate results from the Plastic Pipe Study, 3rd Party Damage Program, Public Awareness and other sources

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- Implementation Plan
 - On target for 8/2/2011 implementation of DIMP
 - Written Implementation Plan complete – addresses:
 - ✦ Additional information needs - DOT reporting and data cleanup
 - ✦ Resource needs - software/hardware, voucher (outside services) dollars, and Management approval of company labor hours
 - ✦ Training – CBT training courses developed

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MEC's Approach to Risk Prioritization

What is Risk?

$\text{Risk} = \text{Likelihood of Failure} * \text{Consequences of Failure}$

What is Failure?

$\text{Failure} = \text{An unintended release of gas that results in an incident (fire or explosion)}$

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Model background

- Mains Replacement Prioritization (MRP) developed by GL Noble Denton
- Metallic model ONLY – future updates (UPTIME) will include plastic modeling
- Model is proprietary and based upon 15 years of actual pipe performance and incident statistics in a distribution system
- Model is performance based
- Primary purpose is to determine replacement prioritization for Metallic MAINS
- Service leak history is not currently used to score the mains

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Model Input and Parameters

- Model's input includes:
 - Facility data (material, size, pressure, etc.)
 - Gas Leak data
 - Proximity data
 - Cover type data
 - Replacement costs
- Modeling parameters include:
 - Time frame for replacement
 - Budget information
 - Replacement strategies (i.e. merging, buffering, etc.)

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Model Output

- Model's output includes:
 - Graphical results – indicates risk scores by pipe segment and resulting replacement “Projects”
 - Tabular results – can display resulting Project footages, and costs

Sioux City IA Area MRP Results

Find FID | Project YYYY | Find Leak Mains | Print

Results

2011 (8)

Projects (8)

Project 24

PIPEID	3864125
Measured Length	561
CREW_HQ	MSR
SUBSCRIPTION_OBJECTID	740

Map Contents

SUXIRiskCondProjView

Projects

Risk

- 0.000006 - 0.000529
- 0.000530 - 0.002710
- 0.002711 - 0.010000

Condition

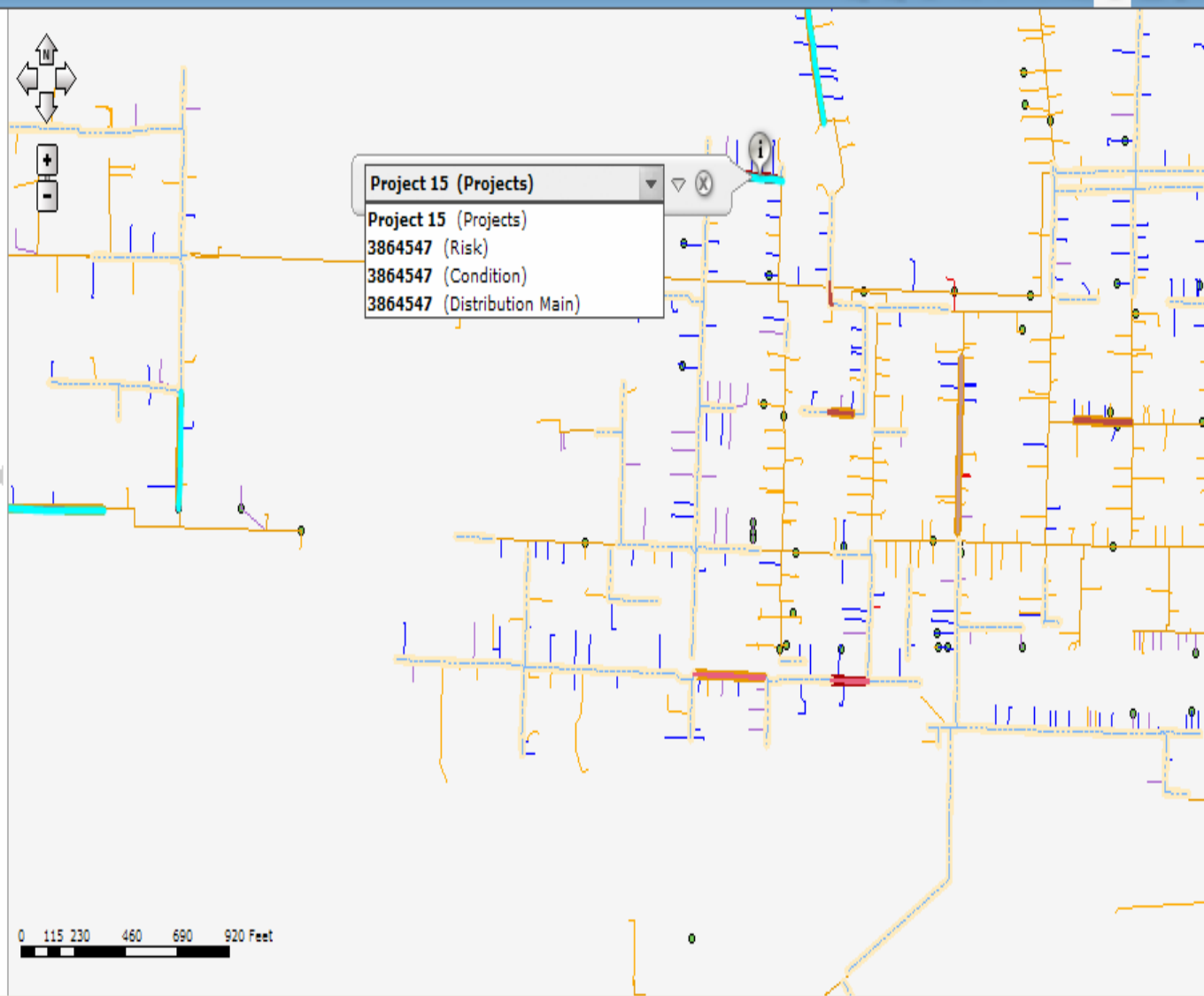
- 0.002720 - 0.094530
- 0.094531 - 0.415510
- 0.415511 - 2.000000

SUXIMainServicesView

Distribution Main

- Bare Steel (1)
- Coated Steel (3)
- Plastic (5)
- Unknown (7)

Leaks - Mains



Sioux City IA Area MRP Results

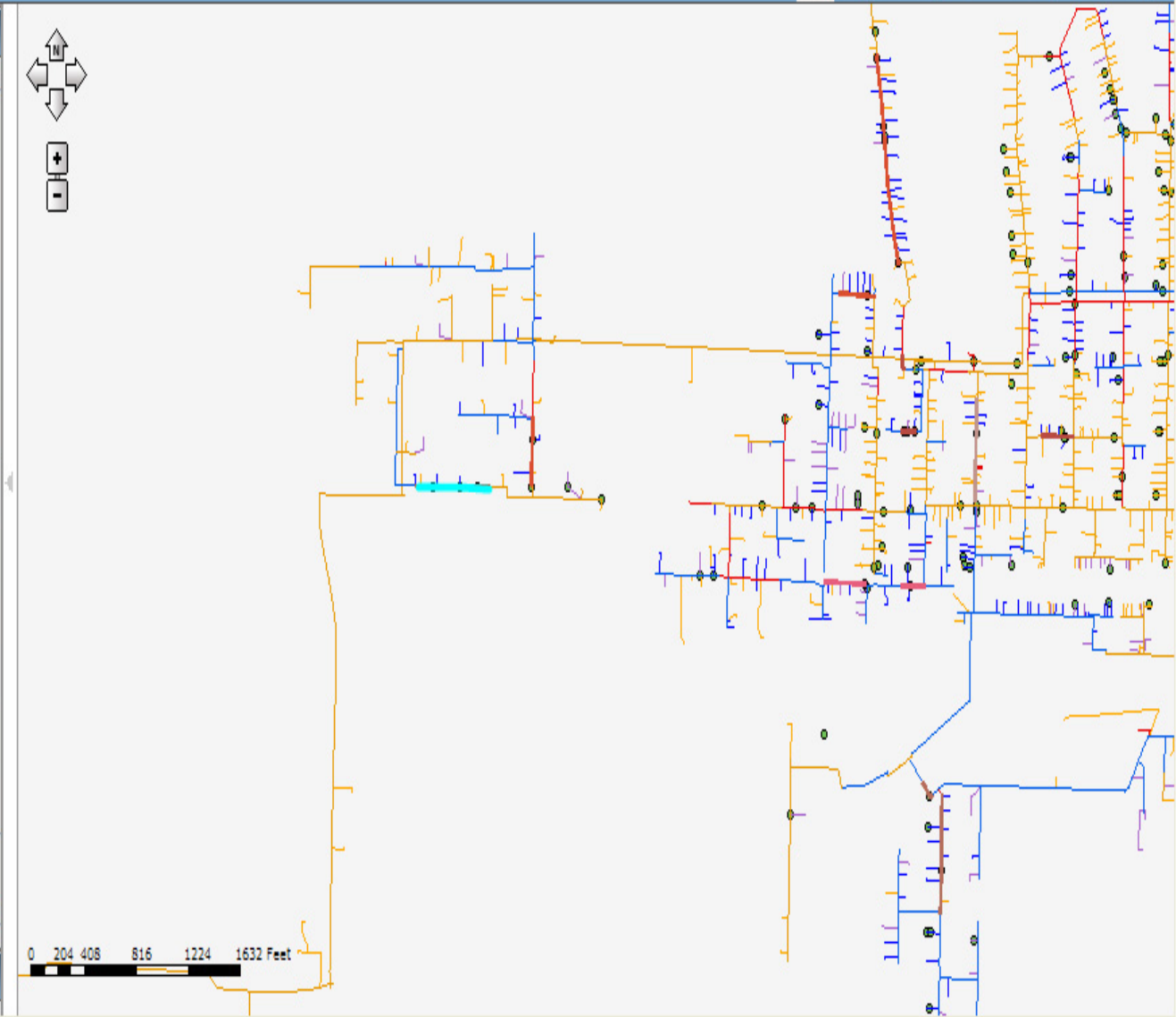
MRp Detail | MRP Summary

Find FID | Project YYYY | Find Leak Mains | Print

Results

- ☒ Find FID (1)
 - ☒ Distribution Main (1)
 - ☒ 3864125
 - PIPEID 3864125
 - Material 1
 - OD 2
 - AOD 2.375
 - Coating BR
 - Mfgr NK
 - In Service 1/1/1940 12:00:00 AM
 - CP Status 1
 - OP 10
 - Length 561
 - Crew HQ AVC
 - Status INS
 - CELLARS 95
 - Prox1 0
 - Prox2 0
 - Prox3 100
 - OPENGRND 29.1279827
 - RISK 0.00107646
 - CONDITION 0.26872
 - NUMSERVICELINES 3
 - JURISDICTION MISSOURI_VALLEY_IA

Map Contents



Sioux City IA Area MRP Results

Find FID | Project YYYY | Find Leak Mains | Print

Results

[Clear All](#)

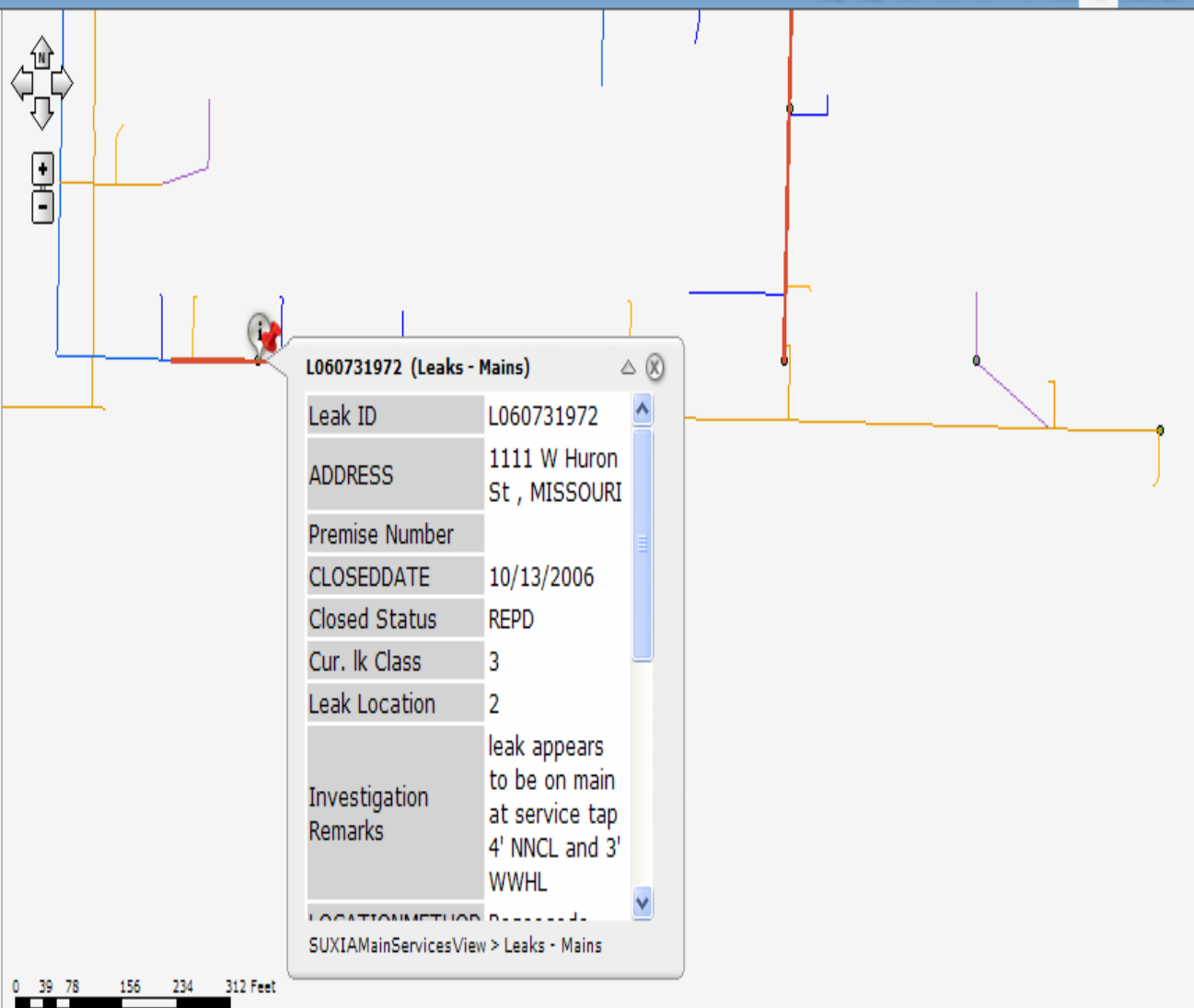
☒ L060731972 (Leaks - Mains) 981328.434, 576552.36 (

☒ L060731972

Leak ID	L060731972
ADDRESS	1111 W Huron St , MISSOURI
Premise Number	
CLOSEDDATE	10/13/2006
Closed Status	REPD
Cur. Ik Class	3
Leak Location	2
Investigation Remarks	leak appears to be on main at service tap 4' NNCL and 3' WWHL
LOCATIONMETHOD	Regeocode
PipeID	3864125
SERVICEID	Null
ASSIGNMENT	Good 25 M
Facility Type	P
Leak Cause	COR
MRP Leak Type	C
Repair Remarks	replaced service tee to eliminate leak. Tested and reconnect
Pipe Material	3

Map Contents

☒ SUXIAMainServicesView



	C	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T
1	FID GLOBAL ID	PROJEC T NAME	PROJEC T YEAR	RPLCE RANK	PIPE TYPE	RPLC E COST	REPAIR Cost	PIPELENGTH	MATERI	DIAMET	TOTAL SCORE	PIPEMATERIAL	PIPEDIA	CrewH	PIPE CONDIT ION	PIPE RISK
2	3877744	Project 3	2011	60	1	20608	230107	157.03229229	3	2	8.49408215	Coated Steel	2	AVC	.50912	.0024219
3	3877745	Project 3	2011	3	0	5938	38214	45.24723452	3	2	9.58924048	Coated Steel	2	AVC	.67564	.00632653
4	3864569	Project 15	2011	73	1	36619	409148	279.03678975	1	2	8.43838158	Bare Steel	2	AVC	.50937	.00232792
5	3864626	Project 15	2011	7	1	6373	71945	48.55995277	1	2	9.05603118	Bare Steel	2	AVC	.67589	.00339098
6	3864547	Project 15	2011	15	0	9621	69948	82.83449582	3	2	9.30424163	Coated Steel	2	AVC	.67554	.00440307
7	3864082	Project 24	2011	66	1	13916	170639	100.13377853	1	2	8.46136958	Bare Steel	2	AVC	.45443	.00244069
8	3864125	Project 24	2011	7	2	22453	487601	171.09273649	1	2	8.7741889	Bare Steel	2	AVC	.67589	.00271466
9	3864130	Project 24	2011	47	0	597	3842	4.54701286	1	2	9.08635181	Bare Steel	2	AVC	.67589	.00346374
10	3911210	Project 94	2013	48	0	15895	137599	121.11758545	1	2	8.68915115	Bare Steel	2	RDK	.45443	.00293709
11	3911211	Project 94	2013	14	1	8659	99697	65.97853701	3	2	8.78452022	Coated Steel	2	RDK	.45403	.00316671
12	3911186	Project 94	2013	15	1	13013	90355	91.52587179	3	3	8.96210998	Coated Steel	3	RDK	.45423	.00359248
13	3890990	Project 99	2013	32	0	1536	66490	11.70612345	1	2	8.09452721	Bare Steel	2	RDK	.45443	.00182397
14	3864505	Project 111	2013	85	0	6614	28613	50.39895713	3	2	8.81018953	Coated Steel	2	AVC	.45418	.00322802
15	3864509	Project 111	2013	13	1	13705	94706	95.96343903	3	3	9.01057057	Coated Steel	3	AVC	.45408	.00370906
16	2257574	Project 117	2013	62	0	6633	42565	44.63795196	3	1.25	8.6250751	Coated Steel	1.25	SCSE	.45408	.002784
17	11810244	Project 124	2013	87	0	645	3656	4.91741554	1	1.5	8.80601053	Bare Steel	1.5	IDA	.67589	.00279102
18	3922272	Project 125	2013	73	0	14938	171732	101.63297238	1	2	8.56385722	Bare Steel	2	AVC	.67589	.00231419
19	3922695	Project 125	2013	52	1	15046	161113	108.74416846	1	2	8.65003111	Bare Steel	2	AVC	.67589	.00245907
20	3864391	Project 163	2014	49	1	2616	17959	19.93236465	1	2	8.3675212	Bare Steel	2	AVC	.47738	.00225195
21	3864291	Project 163	2014	6	0	22224	371694	163.25009858	1	2	8.77935532	Bare Steel	2	AVC	.50922	.00304803
22	3864401	Project 166	2014	59	0	3338	67029	29.43957775	3	3	8.30501953	Coated Steel	3	AVC	.50922	.00210392
23	3864398	Project 166	2014	47	1	22716	469662	182.61925947	1	2	8.31524479	Bare Steel	2	AVC	.45428	.00219523
24	11793273	Project 250	2016	6	0	9365	150196	74.97859121	3	2	8.84197893	Coated Steel	2	AVC	.50907	.0031986
25	3890761	Project 252	2016	67	0	8132	70397	61.96498449	3	2	8.59132779	Coated Steel	2	RDK	.45443	.00270235
26	3864492	Project 270	2016	17	1	3758	24413	22.53804703	3	2	8.36753790	Coated Steel	2	AVC	.47733	.00225205
27	3864488	Project 270	2016	91	0	4119	17820	31.38824811	3	2	8.7850654	Coated Steel	2	AVC	.45418	.00316773
28	2232652	Project 280	2016	14	0	13954	189569	94.52042469	1	2	8.74565588	Bare Steel	2	SCSE	.45443	.00307268
29	4065740	Project 333	2017	45	0	12898	123984	80.56891915	1	1.5	8.55392525	Bare Steel	1.5	AVC	.50922	.00252237
30	11507158	Project 342	2018	25	0	353	4697	2.686878	1	2	8.70219851	Bare Steel	2	SCSE	.50912	.00286308
31	11019817	Project 347	2018	33	0	13957	130996	106.3555141	1	1.25	8.64403133	Bare Steel	1.25	IDA	.50937	.00272301
32	4013700	Project 348	2018	21	0	16950	262691	129.16187011	1	1.5	8.72454576	Bare Steel	1.5	IDA	.67589	.00259554
33	12792295	Project 350	2018	34	0	7869	79265	54.05853109	1	2	8.63237149	Bare Steel	2	AVC	.50937	.00269503
34	3864478	Project 350	2018	5	0	14992	150191	102.42941785	1	2	8.93229159	Bare Steel	2	AVC	.50937	.00341474
35	3877755	Project 352	2018	61	0	2532	28288	19.2924649	3	2	8.49375172	Coated Steel	2	AVC	.50937	.002421
36	12631538	Project 374	2018	53	0	8684	178093	66.1758789	3	2	8.34849819	Coated Steel	2	RDK	.45433	.00225107
37	3891125	Project 429	2019	25	0	9414	77962	60.40579687	3	3	8.70383064	Coated Steel	3	RDK	.45413	.00297289
38	4065792	Project 437	2019	37	1	29906	451505	179.3918434	3	3	8.20737916	Coated Steel	3	AVC	.45433	.00201382
39	4065796	Project 437	2019	32	0	9804	248806	62.91377014	3	3	8.22178832	Coated Steel	3	AVC	.45433	.00203805
40	3930045	Project 439	2019	59	0	55739	170700	106.00342055	3	3	8.5900007	Coated Steel	3	SCSE	.45403	.00257500

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What about plastic and other materials?

- Material performance is measured from:
 - Plastic Pipe Study (currently a 3-year cycle)
 - Gas Leak Data
 - Material Failure Data
 - SME knowledge and experience
 - Material Testing/Studies

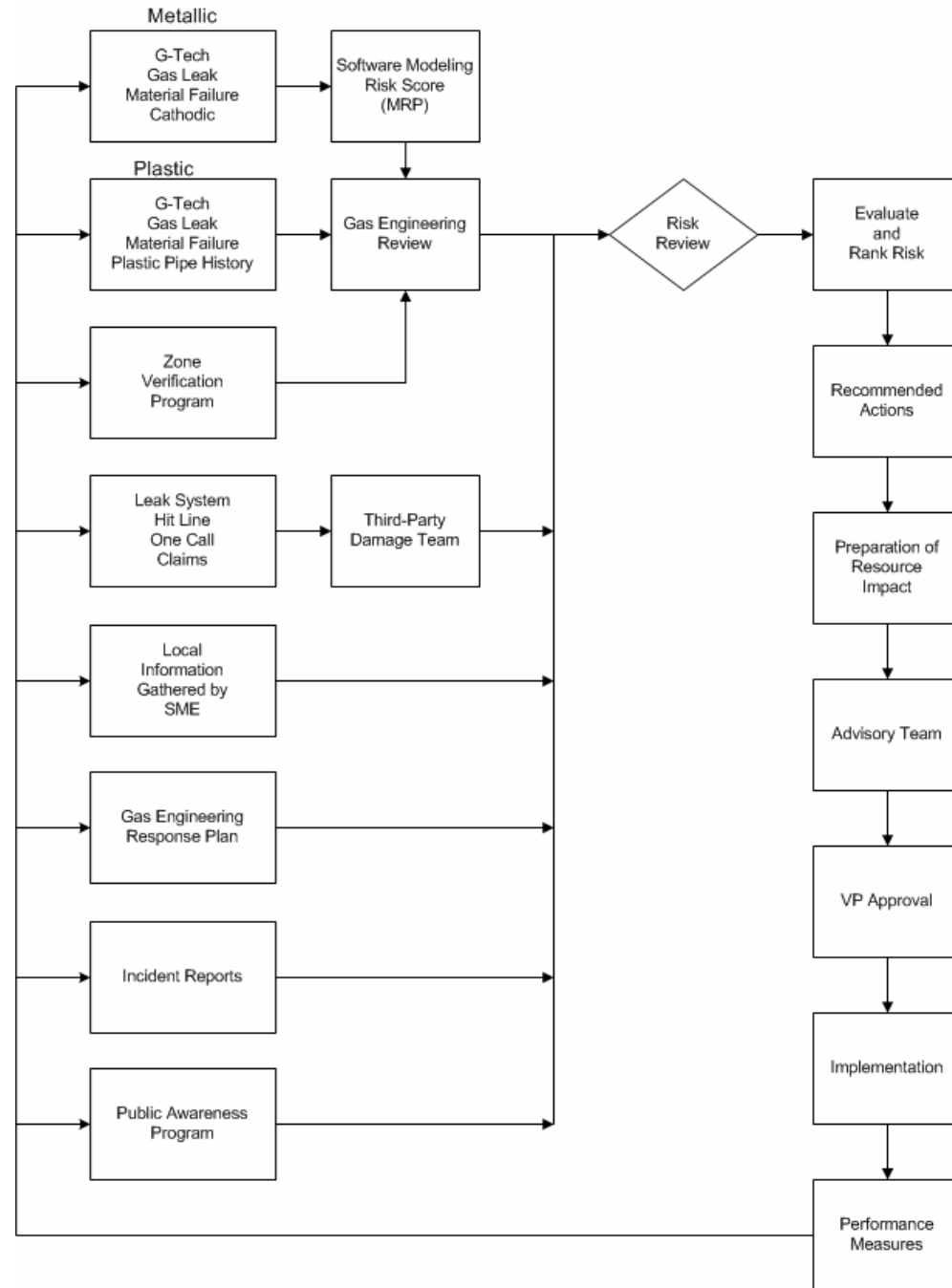
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How Does it all Come Together?

- Current Process:
 1. MRP model is assembled and run
 2. Distribution statistical summary report is completed
 3. Additional performance information is gathered, i.e. CP performance, Plastic Pipe Study, Material Failure trends, etc.
 4. The SME's gather information pertinent to their area, i.e. local construction projects
 5. "Risk Review" Meetings are held
 6. SME's and DIMP Manager work together to form **both O&M and Capital strategies** to reduce risk on the distribution system
 7. The resulting projects are approved by Advisory Team, and Management and are budgeted for following years

Risk Ranking Process Flowchart



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QUESTIONS?