



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Pipeline Integrity Management Gas Transmission Pipelines

TPSSC Meeting

May 28-29, 2003

Mike Israni



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Definitions

1. High Consequence Area

- Bifurcation Option for building (SIHO) count (192.761):*

Goal: Identify those segments of a pipeline that present the greatest potential hazard to people in order to focus integrity management efforts on those segments.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

1. *High Consequence Area – Bifurcation Option (192.761):*

Should a rule allow two options for building count (SIHO)* : following the definition of high consequence areas defined by final rule on August 6, 2002;(67 FR 50824) or using potential impact circles along the entire length of the pipeline?

Requirements for how an operator treats identified sites (i.e. places where people congregate and hard to evacuate buildings) that are defined in the high consequence area would not change under either option.

*SIHO = Structures Intended for Human Occupancy



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Description: Bifurcation Option

- An HCA is either:
 - Class 3 or class 4, *PLUS*
 - PIC with identified site, *PLUS*
 - Any PIC >660 ft. with 20 SIHOs*
- OR
- PIC with 20 SIHOs*, *PLUS*
- PIC with identified site
- Includes all pipe within any circle meeting criteria

*SIHO = Structures Intended for Human
Occupancy



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Bifurcation Option

- **Industry:** Uniformly support the option
- **State:** Class 3 and 4 should be included, PIC for elsewhere
- **Public:** Support for the option



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

1. *High Consequence Area – Bifurcation Option (192.761):*

Current position(Considering):

Allow bifurcation option for building
count.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Definitions

2. Population threshold (192.761):

Goal: Identify those portions of a pipeline that present the greatest potential hazard to people in order to focus integrity management efforts on those segments.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

2. Population threshold (192.761):

Should the criterion for determining the population density component of a high consequence area be based on 10 or 20 buildings intended for human occupancy within the impact circle?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Population Threshold

- **Industry:** 20 buildings
- **State:** 10 buildings
- **Public:** 20 buildings (1 comment)

Related Comments

- **State:** Include critical infrastructure
- **Public:** Use 10 vs. 20 people for outside gatherings



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

2. Population threshold (192.761):

Current position (Considering):

20 buildings intended for human occupancy occurring within a potential impact circle as a criterion for defining HCAs.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Definitions

3. Impact radius safety margin (192.761):

Goal: Assure that the identification of high consequence areas includes the population at risk from potential pipeline accidents.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

3. *Impact radius safety margin(192.761):*

Should additional safety margin be applied to the potential impact circle radius calculated using the C-FER equation?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Impact Radius

- **Industry:** Adding length of pipe addresses elliptical impact shape
- **State:** Margin needed (1 comment)
- **Public:** Do not add margin if would add confusion
- **NTSB:** Consider horizontal jetting



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

3. Impact radius safety margin(192.761):

Current position (Considering) :

Use of C-FER radius (without additional safety margin) to define potential impact circle to define an HCA. Extend the length of pipeline segment that could potentially impact an HCA (on either side) by one additional radius to meet our concerns for elliptical shape of explosion foot print in many accidents.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Definitions

4. Population Extrapolation (192.761):

Goal: Avoid imposition of unreasonable burdens while assuring consideration of the entire population at risk for potential pipeline accidents in HCA identification.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

4. Population Extrapolation (192.761):

Should a rule allow an operator to use data regarding the number of buildings within 660 feet of the pipeline (available now to operators because of the existing definition of class locations) to infer (extrapolate) the building density in potential impact circles larger than 660 feet?

Should this be limited to an interim period of five years to allow operators to collect additional data on buildings beyond 660 feet?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Pop. Extrapolation

- Industry:
 - Allow until 12/17/07 or data is available, whichever first
- State
- Public



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Definitions

4. Population Extrapolation (192.761):

Current position (Considering):

Allow interim period of up to 3 years (from date of the rule) to gather data beyond 660 ft. for population density. Identified sites must be determined within one year of effective date of rule.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Assessment

5. Low-stress pipelines (192.763(g)(1)):

Goal: Reduce assessment burden for pipe not expected to fail by rupture, but still provide enhanced protection for high consequence areas.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

5. Low-stress pipelines (192.763(g)(1)):

- (a) Should assessment requirements for low-stress pipeline operating at or above 20% SMYS but less than 30 percent SMYS allow use of only confirmatory direct assessment (CDA) for reassessments? (baseline assessment: Pressure test, ILI or DA)**
- (b) Should assessment requirements for low stress pipelines operating below 20% SMYS allow use of CDA for both baseline and reassessments?**
- (c) Should Preventive and Mitigative requirements in Class 3 & 4 locations outside of impact circles be enhanced to provide added assurance?**



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Low-Stress Pipelines

- **Industry:**
 - Use B31.8S intervals
 - Preventive and mitigative measures
- **States:**
 - Longer intervals (1 comment)
 - Shorter intervals (1 comment)
- **Public**
 - Full baseline needed



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

5. *Low-stress pipelines (192.763(g)(1)):*

Current position (Considering):

(a) $<30\%$ but $\geq 20\%$ SMYS

Baseline assessments: DA, ILI, or PT.

Reassessment: 20 years + CDA required at 7 and 14 years.

(b) $< 20\%$ SMYS

Baseline: CDA (10 yrs)

Reassessment: CDA (every 7 yrs)

(c) In class 3 or 4: additional preventive and mitigative measures



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Description: Enhanced Protective and Mitigating Measures

- In Class 3 and 4 areas NOT in HCAs: (considering)
 - Increased frequency of leak survey
 - Required one-call participation
 - Qualified staff to mark/locate and supervise excavations
 - Monitor all excavations OR more frequent patrols with follow-up



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

DA vs. CDA

	DA	CDA
Prepare Plan / Define Criteria	Yes	Yes
Indirect Exams	2 tools	1 tool
Excavate “immediate”	Yes	Yes
Excavate “Scheduled”	2	1
Excavate “monitored”	1	0



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Assessment

6. *Pressure Testing for Material and Construction Defects (192.763(g)(3)(iii)):*

Goal: Assure protection against material and construction defects that could result in delayed failures.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

6. Pressure Testing for Material and Construction Defects (192.763(g)(3)(iii)):

Should the requirement to pressure test pipeline to verify integrity against material and construction defects be limited to pipeline segments for which information suggests a potential vulnerability to such defects? If so, what information should be relied upon?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Material and Construction Defects

- **Industry**
 - Historical safe operation demonstrates stability
 - Separate assessments should not be required
- **States**
 - Arbitrary test should not be required (1 comment)
- **Public**



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

6. Pressure Testing for Material and Construction Defects (192.763(g)(3)(iii)):

Current position (Considering):

Pressure test for material and construction defects only required where actual operating pressure increases above highest level experienced in previous 5 years.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Assessment

7. Direct Assessment Equivalency (192.763(h)(1) and (k)(3)(iii)):

Goal: Assure that direct assessment provides an understanding of pipeline integrity comparable to that provided by other assessment methods.

192.763(h)(1) : Should DA be allowed as a primary assessment method contingent only on its applicability to the threats?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

7. *Direct assessment equivalency (192.763(k)(3)(iii)):*

Should the assessment intervals required for direct assessment be revised to be the same as those applicable to in-line inspection or pressure testing?

Are there opportunities to quickly schedule and assess research demonstrations to provide additional data on which to base judgments about validity?

Would a longer baseline assessment interval produce data that would lead to early improvements in the DA process, thereby increasing the effectiveness (or assurance) of the process in later application?



U.S. Department of Transportation

Research and Special Programs Administration



Office of Pipeline Safety

Assessment Schedules

	ILI & PT >50% SMYS	ILI & PT ≤50% SMYS	DA
Baseline	10 years¹	10 years¹	7 years
50% Baseline	5 years	5 years	4 years
Confirmatory	7 years	7 years	7 years
Reassessment	10 years	15 years	5/10 years²

¹ 13 years if in moderate risk area

² 10 years if excavate all indications
5 years if excavate sample indication



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Assessment Schedules

- **Industry**
 - Strong support for DA intervals same as ILI / PT
- **States**
 - 10-year baseline (1 comment)
 - 5-year reassess, even if excavate all anomalies (1 comment)
- **Public**
 - DA is unproven



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

7. *Direct assessment equivalency (192.763(h)(1) & (k)(3)(iii)):*

Current position(Considering):

Allow DA as a primary assessment method contingent only on its applicability to the threats.

Revise required intervals (baseline and reassessment) for DA to be the same as those required for ILI and pressure testing.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Assessment

8. Plastic transmission lines (192.763(g)(1)):

Goal: Provide enhanced protection to high consequence areas when standard assessment techniques will not work.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

8. Plastic transmission lines (192.763(g)(1)):

What assessment requirements should be applicable to plastic transmission pipelines?

What operational and failure experience exists for operational plastic transmission pipelines (e.g., number of failures, causes, conditions contributing to failure)?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Plastic Pipelines

- **Industry**
 - Limited mileage; low pressure
 - threat of concern is damage
 - rely on enhanced protective measures
- **State**
 - Supports industry position
- **Public**



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Assessment

8. Plastic transmission lines (192.763(g)(1)):

Current position (Considering):

Impose no assessment requirements.
Require preventive and mitigative
measures consistent with all low-
pressure pipelines. (Require reliability
analysis based on plastic pipe
database.)



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Repairs

9. Dents and gouges (192.763(i)(4)):

Goal: Assure protection from delayed failures associated with dents and gouges while avoiding unnecessary excavation and repair.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Repair:

9. *Dents and gouges (192.763(i)(4)):*

- (a) Should a repair criteria for dents located on the bottom of the pipeline be different from that allowed for dents located on the top? Should the presence of stress risers or metal loss affect this decision?
- (b) Should the requirement to remediate in 180 days be changed to one year?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Dents and Gouges

- Industry
 - Use B31.8 criteria
 - Change 180 days to 1 year
 - Monitor bottom-side dents
- State
- Public



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Repair:

9. *Dents and gouges (192.763(i)(4))*

Current position (Considering):

- (a) Any dent with a stress riser or gouges should be repaired immediately.
- (b) Revise remediation criteria to allow one year for repair of dents specified in paragraph 192.763(i)(4)(ii).



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Preventive and mitigation measures

10. Treatment of Third-Party Damage (192.763(g)(3)(i)):

Goal: Protect against delayed failures from third-party damage in cost-effective manner.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Preventive and mitigation measures

10. *Treatment of Third-Party Damage (192.763(g)(3)(i)):*

Should additional third-party damage prevention methods be utilized instead of explicit assessments for third-party damage ?

What methods should be used in conjunction with other assessment methods to detect delayed third party damage?

What role should data integration play in determining whether significant potential exists for delayed failure from third-party damage?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Third-party Damage

- **Industry**
 - Prevention is best method to address
 - Assessments should not be required for this threat
- **State**
 - Rely on preventive measures
- **Public**
 - Retain approaches that foster developing technologies to ID



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Preventive and mitigation measures

10. Treatment of Third-Party Damage (192.763(g)(3)(i)):

Current position (Considering):

Require enhanced prevention and mitigation measures where vulnerable to delayed failures following third-party damage



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Preventive and mitigation measures

11. Application of Integrity Lessons Outside HCAs (192.763(c)(5), (g)(3)(v) and (h)(3)(v)(B):

Goal: Assure protection of the entire pipeline from problems identified through assessment activities in high consequence areas.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Preventive and mitigation measures

11. Application of Integrity Lessons Outside HCAs (192.763(c)(5), (g)(3)(v) and (h)(3)(v)(B):

How can the requirements be clarified for the situations when an operator should look beyond the segment in a high consequence area, when segments outside the HCA are likely to have similar integrity concerns as those found inside an HCA?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Actions outside HCAs

- Industry
 - Proposed requirements unwarrantated
 - *beyond legislation*
 - *tend to bring all pipe under rule*
 - *divert attention to lower risk pipe*
 - B31.8S risk assessment process is means to address
- State
 - Use data but treat differently
- Public



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Preventive and mitigation measures

11. Application of Integrity Lessons Outside HCAs (192.763(c)(5), (g)(3)(v) and (h)(3)(v)(B):

Current position(Considering):

Require that operators who identify problems during assessments use that information to update their risk assessment and take actions in other areas potentially at risk, including outside HCAs, as appropriate.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

TPSSC Meeting - Gas IMP (NPRM)

May 28-29, 2003

Performance measures

12. “Real Time” Reporting (192.763(l)(1)):

Goal: Provide current information to state and federal regulators regarding effectiveness of IM programs.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Performance measures

- *“Real Time” Reporting (192.763(l)(1)):*

Should we require monthly/quarterly/yearly electronic reporting of performance measures?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Comments: Performance Measures

- **Industry**
 - Periodic reporting, quarterly for program progress and annual for events
 - Object to electronic access
- **States**
 - Info would be collected through inspection
- **Public**
 - Info should be available to public



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Performance measures

12. “*Real Time*” Reporting (192.763(l)(1)):

Current position(considering):

Require that operators maintain the 4 performance measures and update the information quarterly. Operators must maintain the information in a manner that allows OPS and state regulators to access it electronically.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Moderate Risk Areas

13. Rural Churches (192.761):

Goal: Identify those segments of a pipeline that present the greatest potential hazard to people in order to focus integrity management efforts on those segments.

Should rural buildings (e.g. rural churches, etc.) be designated as MRAs requiring only CDAs or enhanced preventive and mitigative measures?



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

Moderate Risk Areas

13. Rural Churches (192.761):

Current position(considering):

Treat like any other area where people
congregate.



Office of
Pipeline
Safety



U.S. Department
of Transportation

**Research and
Special Programs
Administration**



Office of
Pipeline
Safety

Public Comments on other Issues

- Referencing Standards
 - Support from all quarters
 - Public: must be enforceable
- Confirmatory Direct Assessment
 - Industry: supports
 - States/Public: Untested



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

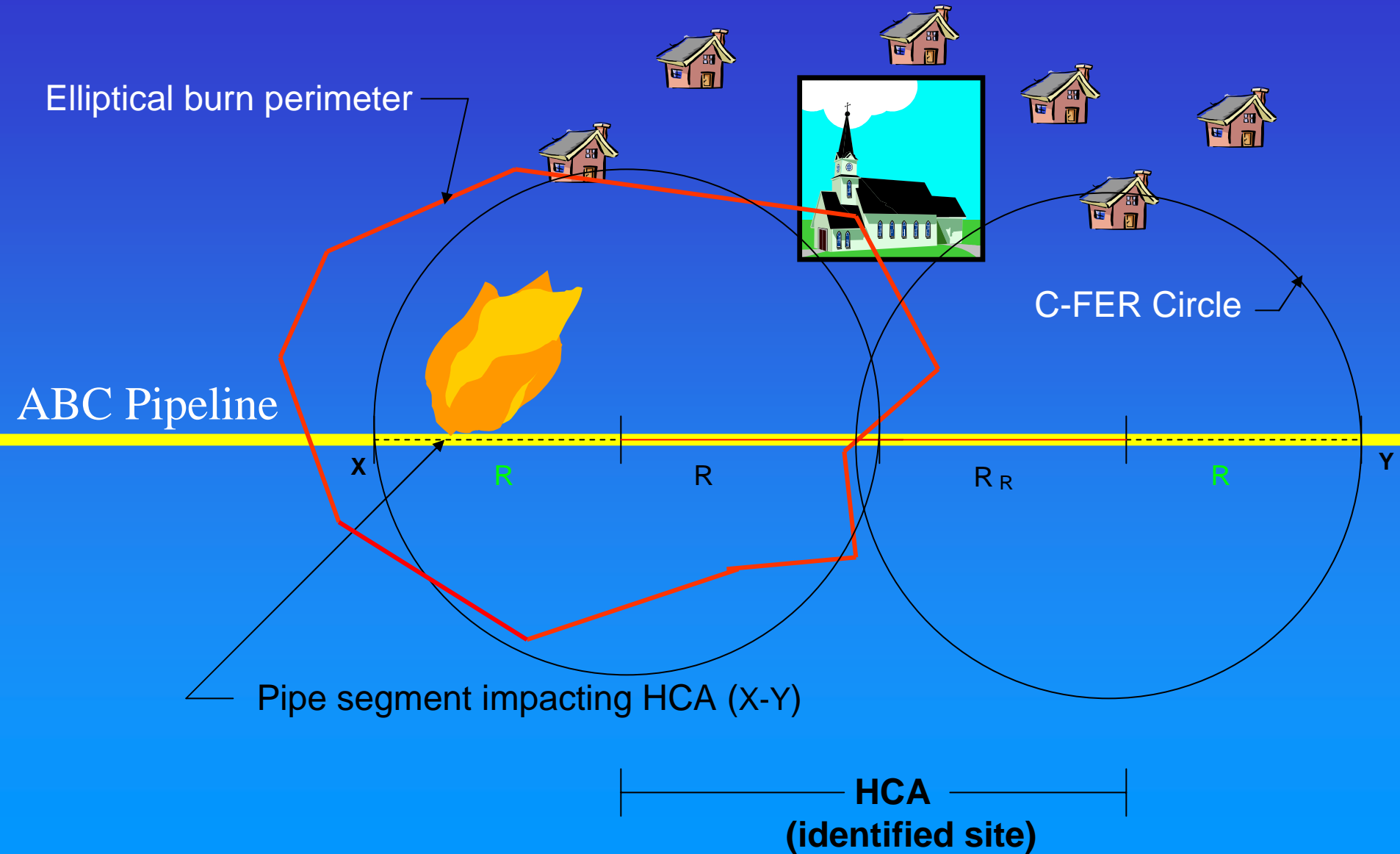


Office of
Pipeline
Safety

Public Comments on other Issues

- **Auto/Remote Valves**
 - Generic studies show not cost beneficial
- **Scope**
 - Include gathering lines (NTSB/State)
- **Reassess/Baseline Overlap**
 - Industry: eliminate
 - Public: required by law

Potential Impact Circles Using C-FER Model



Potential Impact Circles Using C-FER Model

