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Pipeline Integrity Management Gas Transmission Pipelines

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Pipeline Integrity Management

- Our main goals
- Gas HCA - Final rule
- Gas IMP - NPRM
- Milestones

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Our Main Goals

- Provide for increased assurance to the public
- Accelerate integrity assessment of pipelines in high consequence areas (HCA)
- Improve integrity management systems within companies
- Improve the government's role in validating integrity management

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Gas HCA – Final Rule

(High Consequence Areas)

- Class 3 and 4 locations
- Impact radius 300/660/1000* feet
  = 1000 ft for pipe D > 30” & P > 1000 psi
  = 300 ft for pipe D < 12” & P < 1200 psi
- Building or facility having persons who are difficult to evacuate (e.g., schools, hospitals, nursing homes, prisons)
- Places where people congregate (e.g., playgrounds, camping grounds, recreational facilities)

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Gas IMP – NPRM

HCA Definitions (cont.)

- New HCA component : area of an impact circle of threshold radius 1000 ft or larger that has 20 or more buildings (large dia and hi press lines)

……

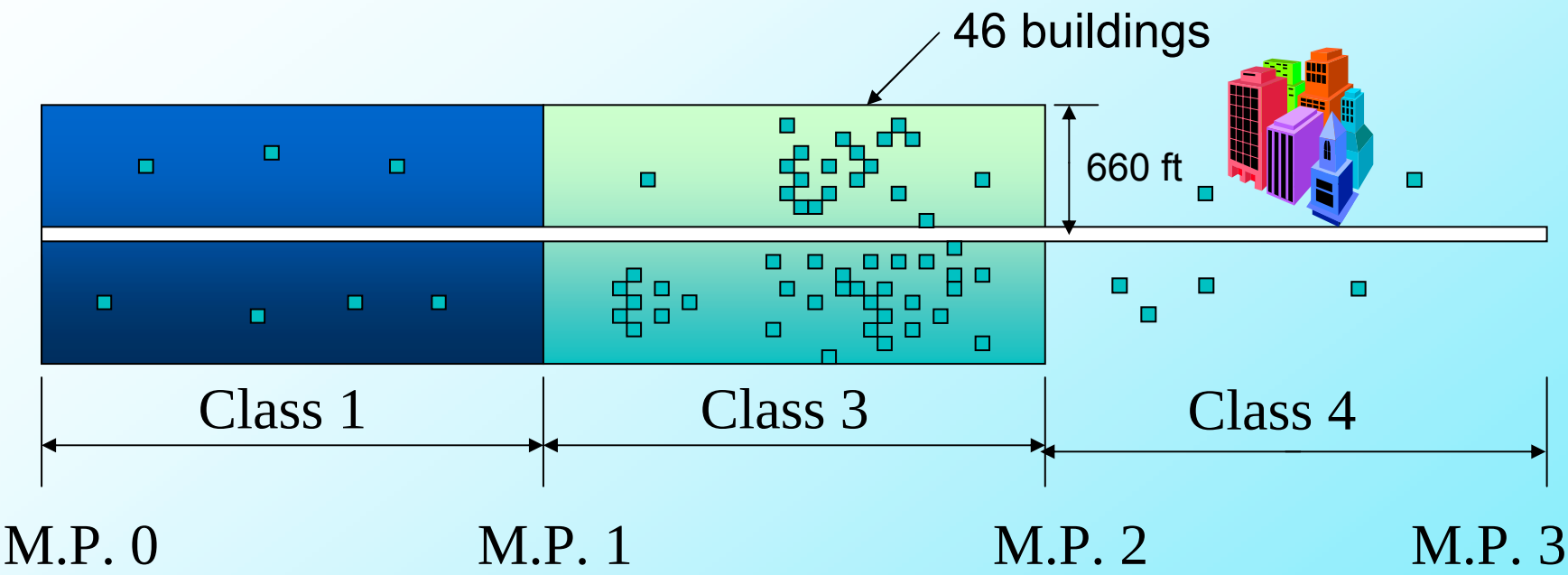
Potential Impact Radius : Use C-FER equation

Threshold Radius : Additional safety margin beyond C-FER calculated PIR

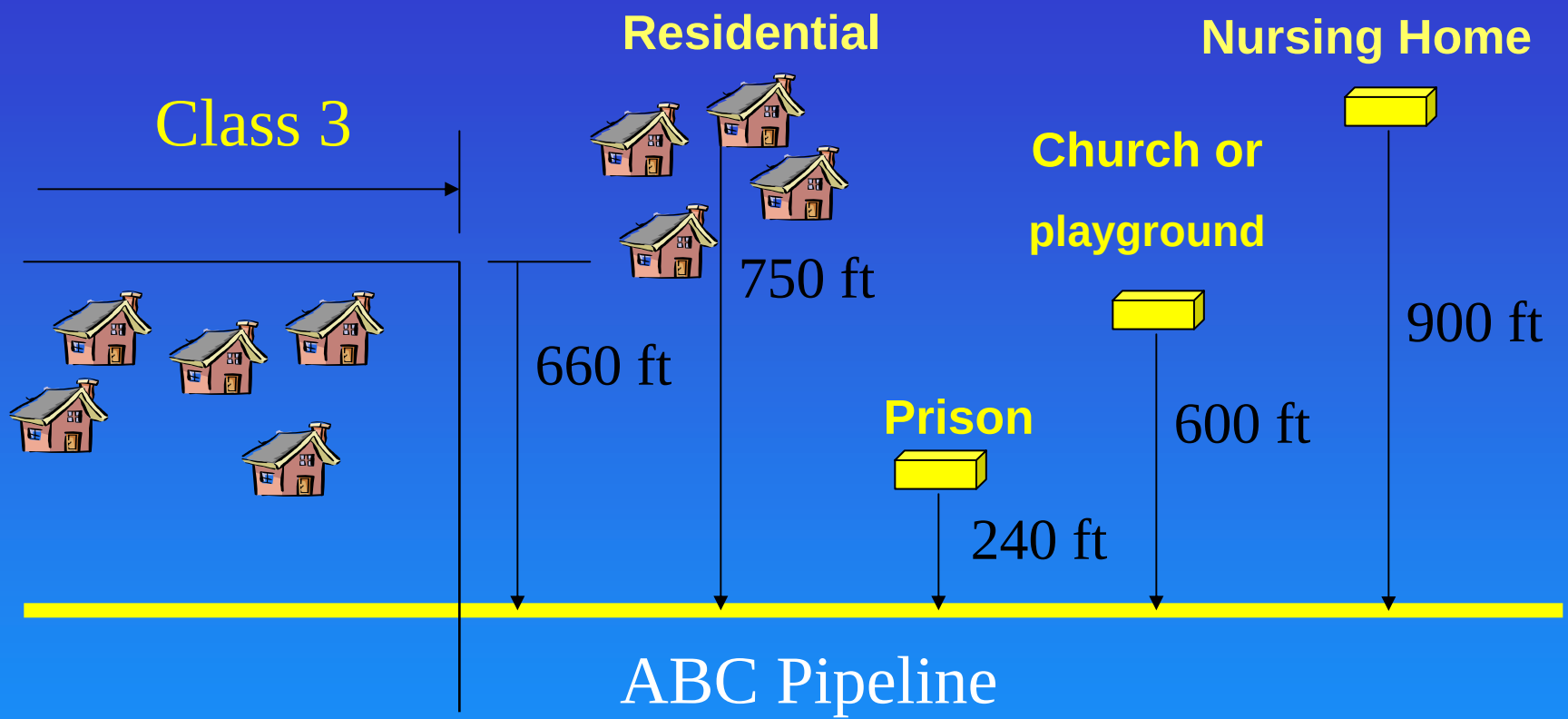
Potential Impact Circle: Contains 20 or more buildings within a circle of threshold radius 1000 ft, or hard to evacuate place in 300/660/1000 ft circle, or a place where people gather in 300/660/1000 ft circle

Potential Impact Zone : Determined by sliding 'Potential Impact Circle' along the pipe

Class Location Determination

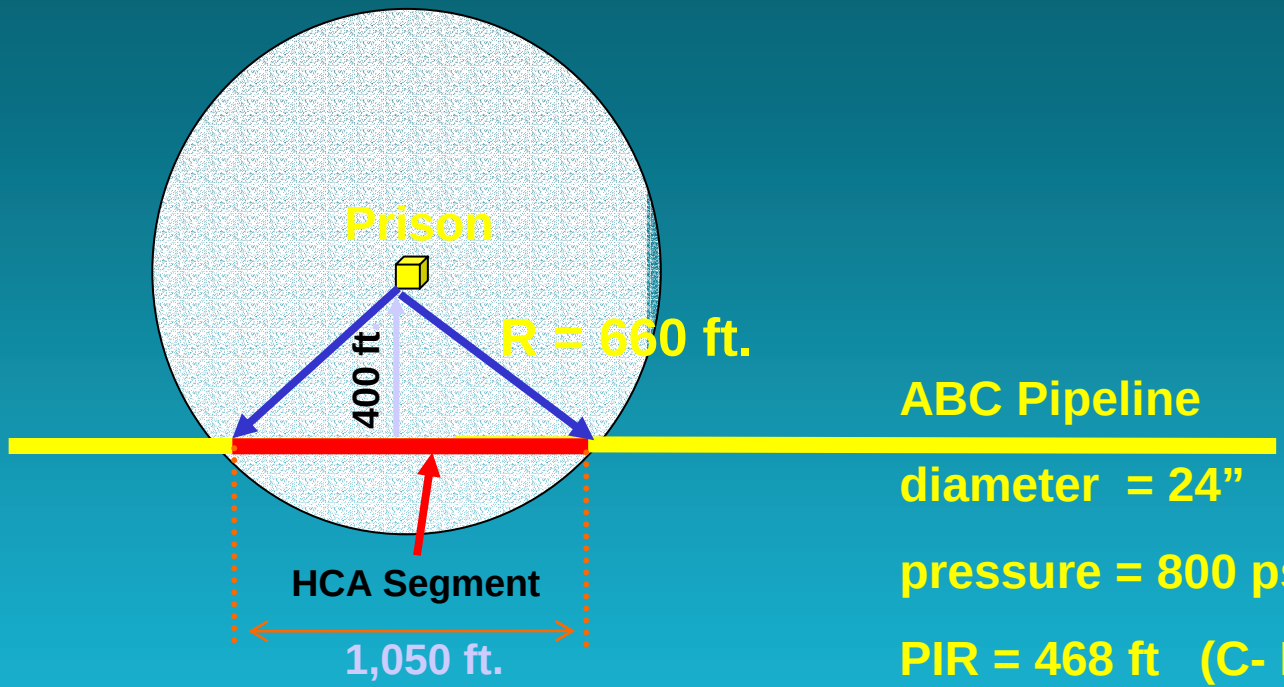


HCA Examples



As buildings and facilities are identified, the distance is measured from the pipeline to the building.

Example of an HCA Segment



ABC Pipeline

diameter = 24”

pressure = 800 psi

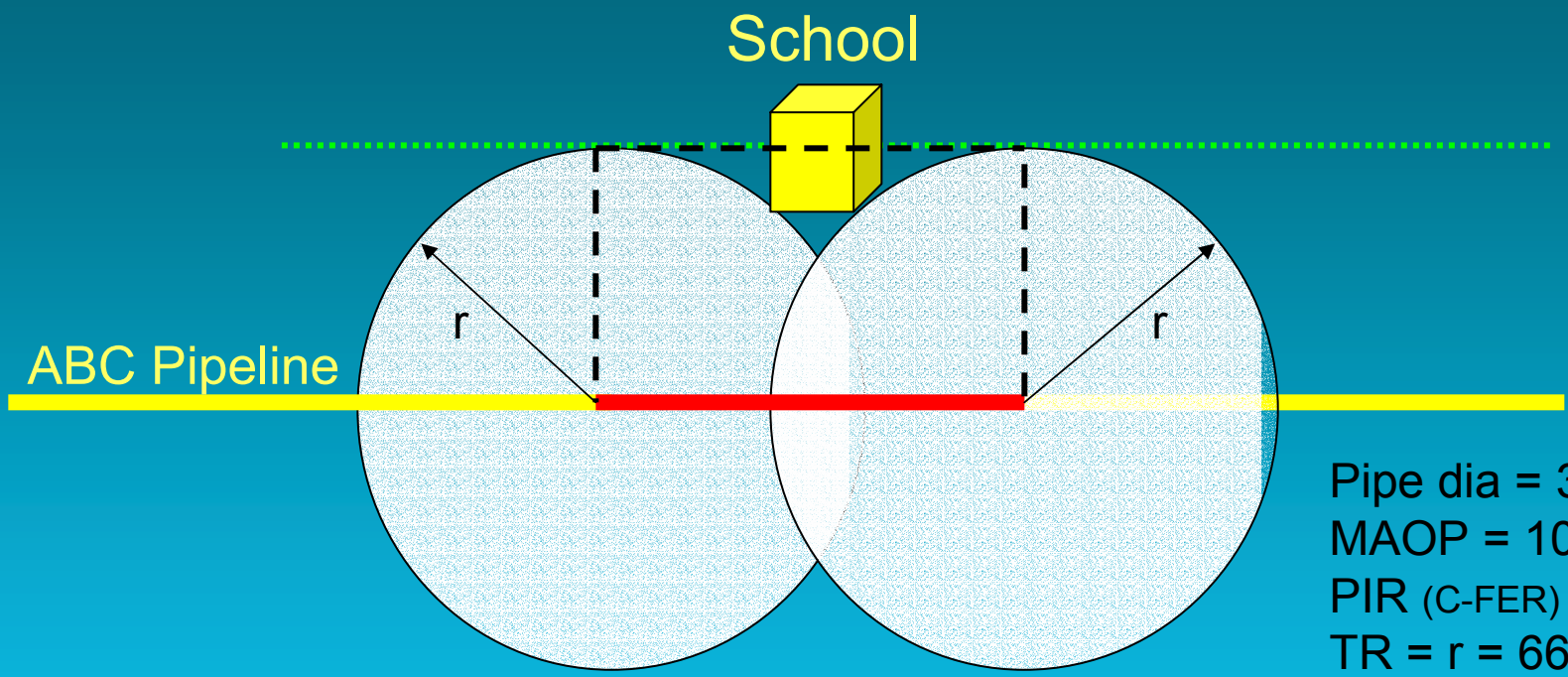
PIR = 468 ft (C- FER)

TR = R = 660 ft

R = distance from closest point of prison to pipeline.

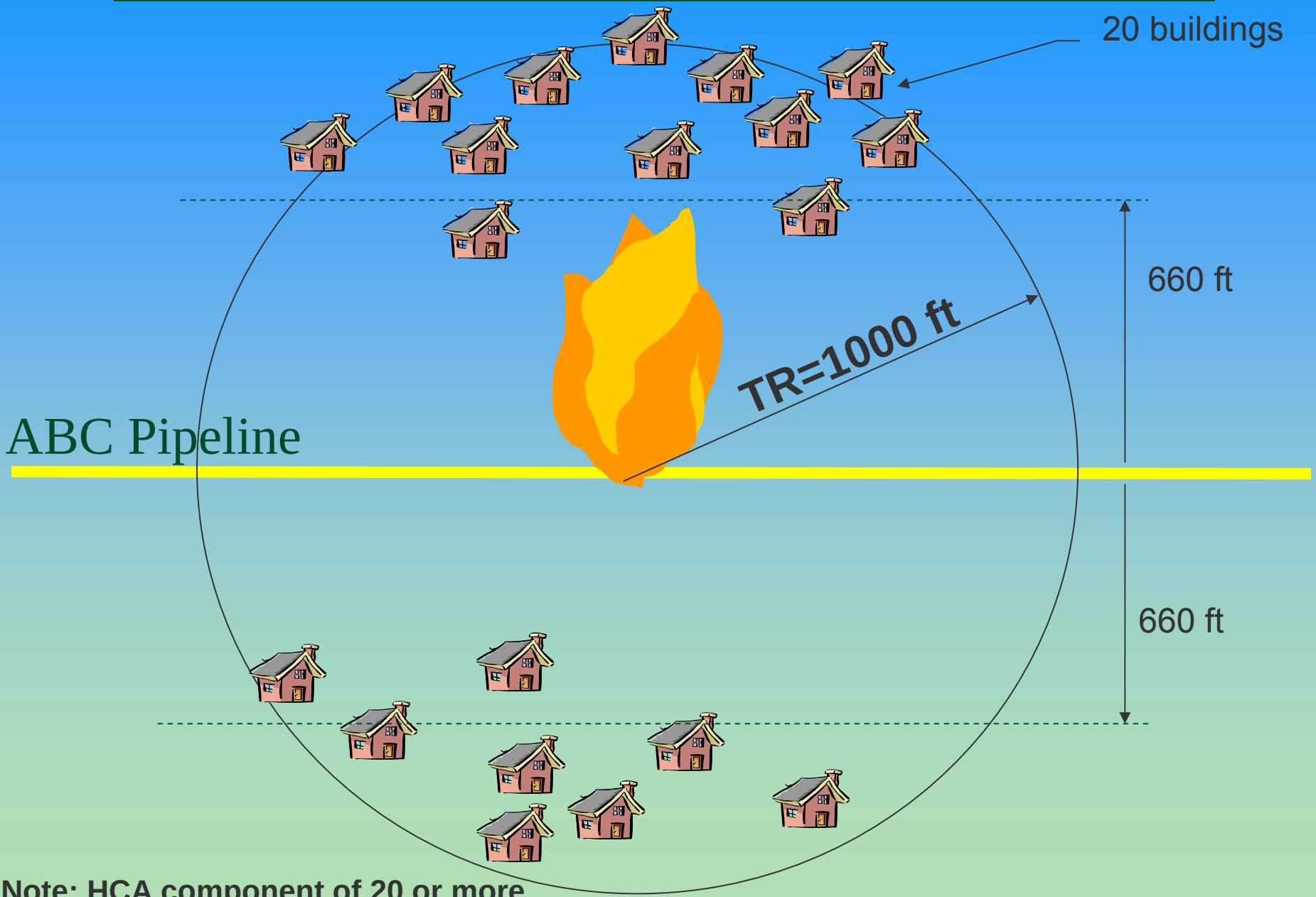
Distance of 660 ft. is specified in final rule 192.761(e)

Determining Potential Impact Zone



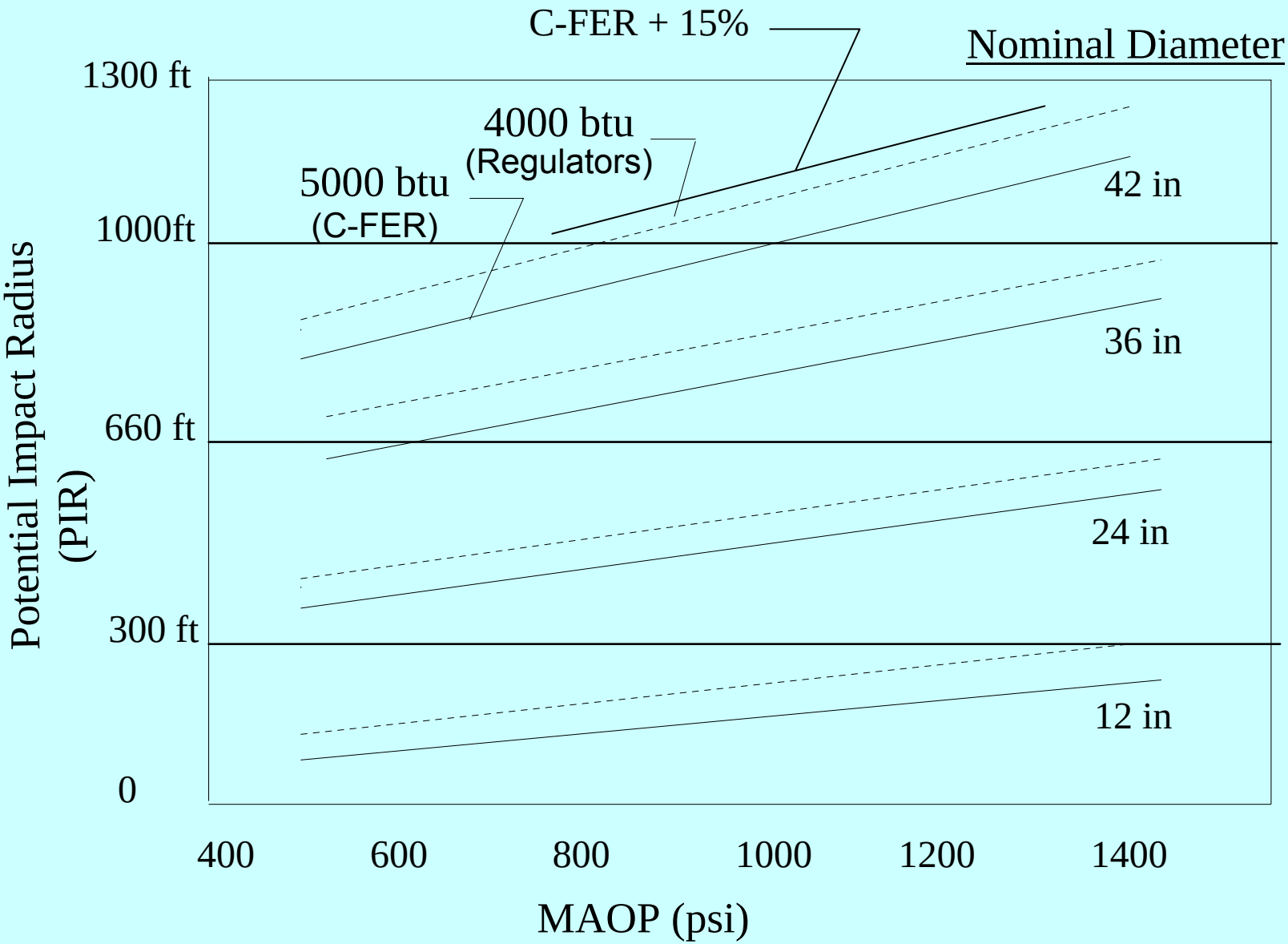
Pipe dia = 30 inch
MAOP = 1000 psi
PIR (C-FER) = 655 ft
TR = r = 660 ft

Potential Impact Circle (HCA example)

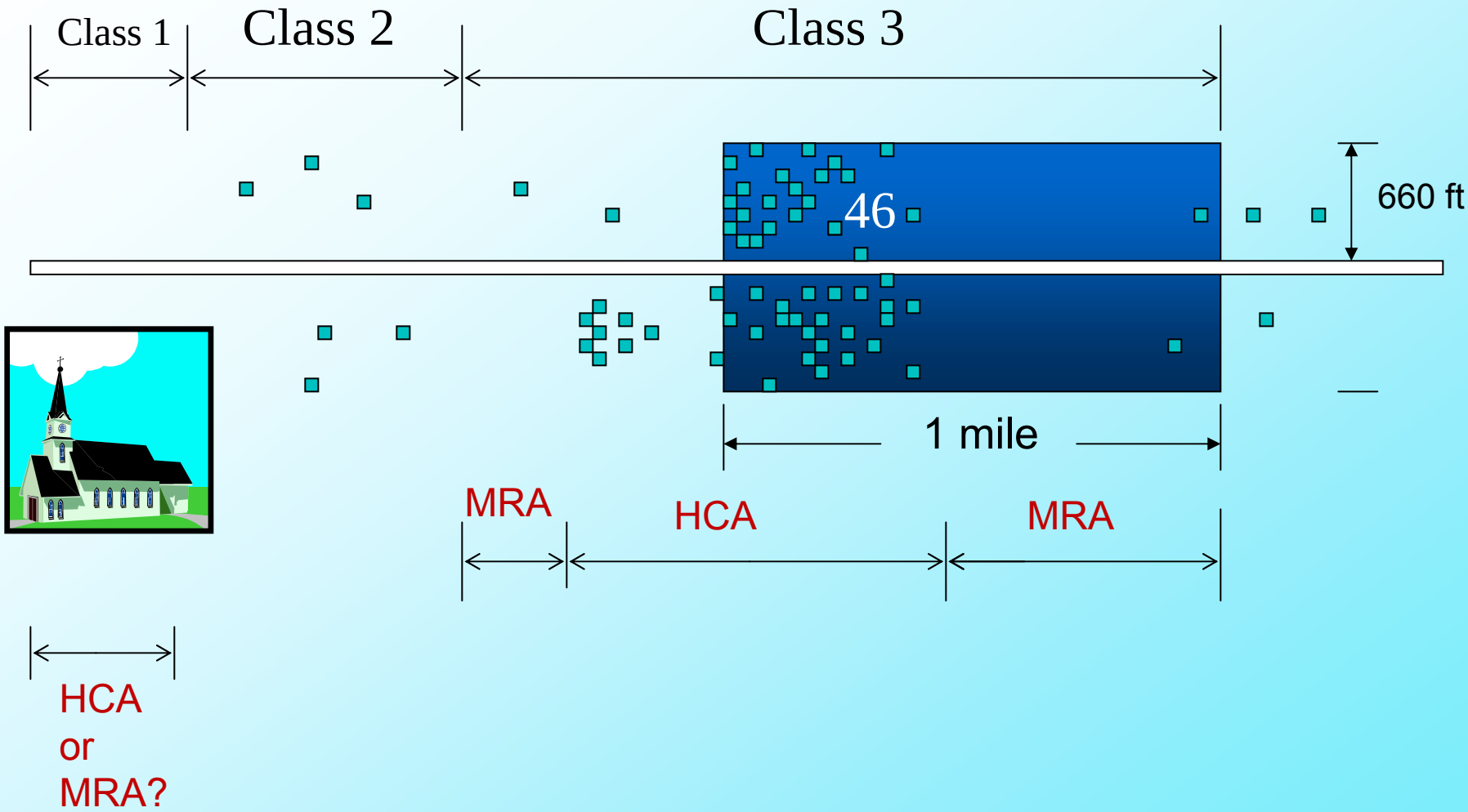


Note: HCA component of 20 or more buildings within a TR 1000 ft applies to large dia and hi press lines

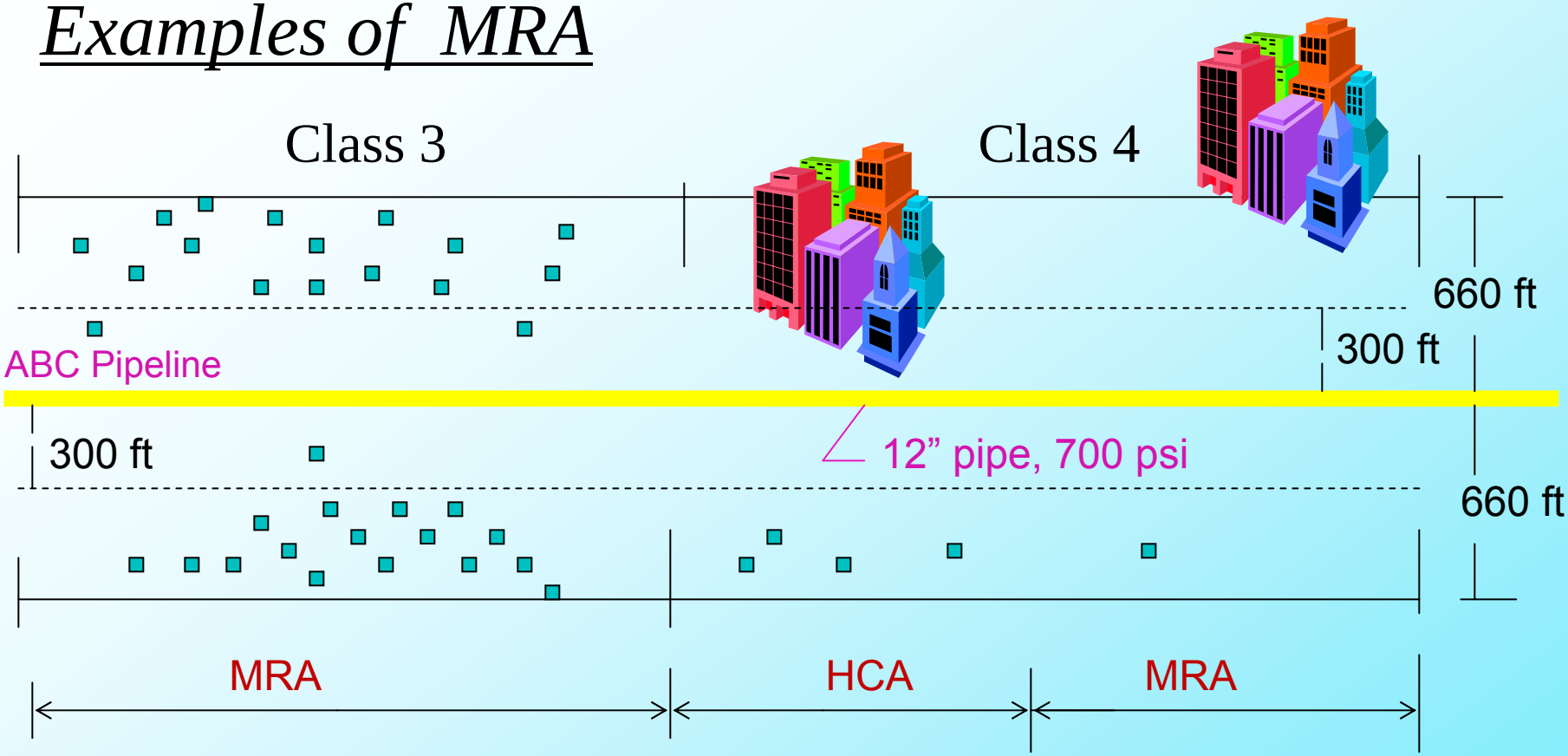
Determining Threshold Radius



Continuous Sliding Mile (examples of MRA)



Examples of MRA



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Gas IMP – NPRM

(Scope)

- All gas transmission lines including those transporting petroleum gas, hydrogen, or other gases covered under Part 192

- No gathering or distribution lines

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Gas IMP – NPRM (Elements)

Identify HCA segments (12 months)

Develop IMP framework (12 months)

Develop a plan (12 months)

- Baseline assessment & DA (if applicable)
- Performance-Based option

Identify and evaluate threats & Remedial actions

Continual evaluation and assessment

Preventive and mitigative measures

Performance measures & Record keeping

Management of change & Quality assurance

Communication plan; Copy of IMP to State

Environmental and safety risk during assessment

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Gas IMP - NPRM

Select Assessment Technology:

- Select technology best suited for type of threat
- Acceptable technologies: ILI, pressure testing, direct assessment (DA) & other equivalent technology
- DA- External Corrosion, Internal Corrosion & SCC

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Gas IMP - NPRM
(Direct Assessment)

- DA is an integrity assessment method utilizing a process to evaluate certain threats (e.g. EC, IC, SCC) to a pipeline's integrity.

- Use of DA as primary method conditional
  - Other assessment methods cannot be applied
  - Substantial impact on consumers
  - Pipeline operates at MAOP <30% SMYS
  - Operator will excavates entire segment

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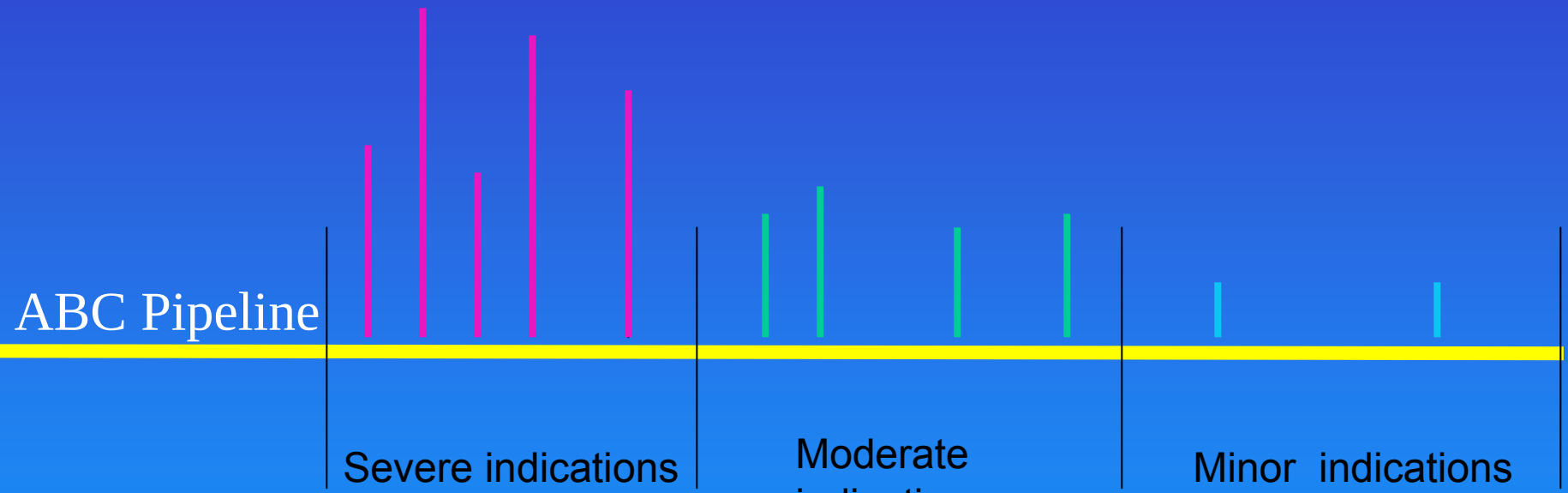
Gas IMP - NPRM

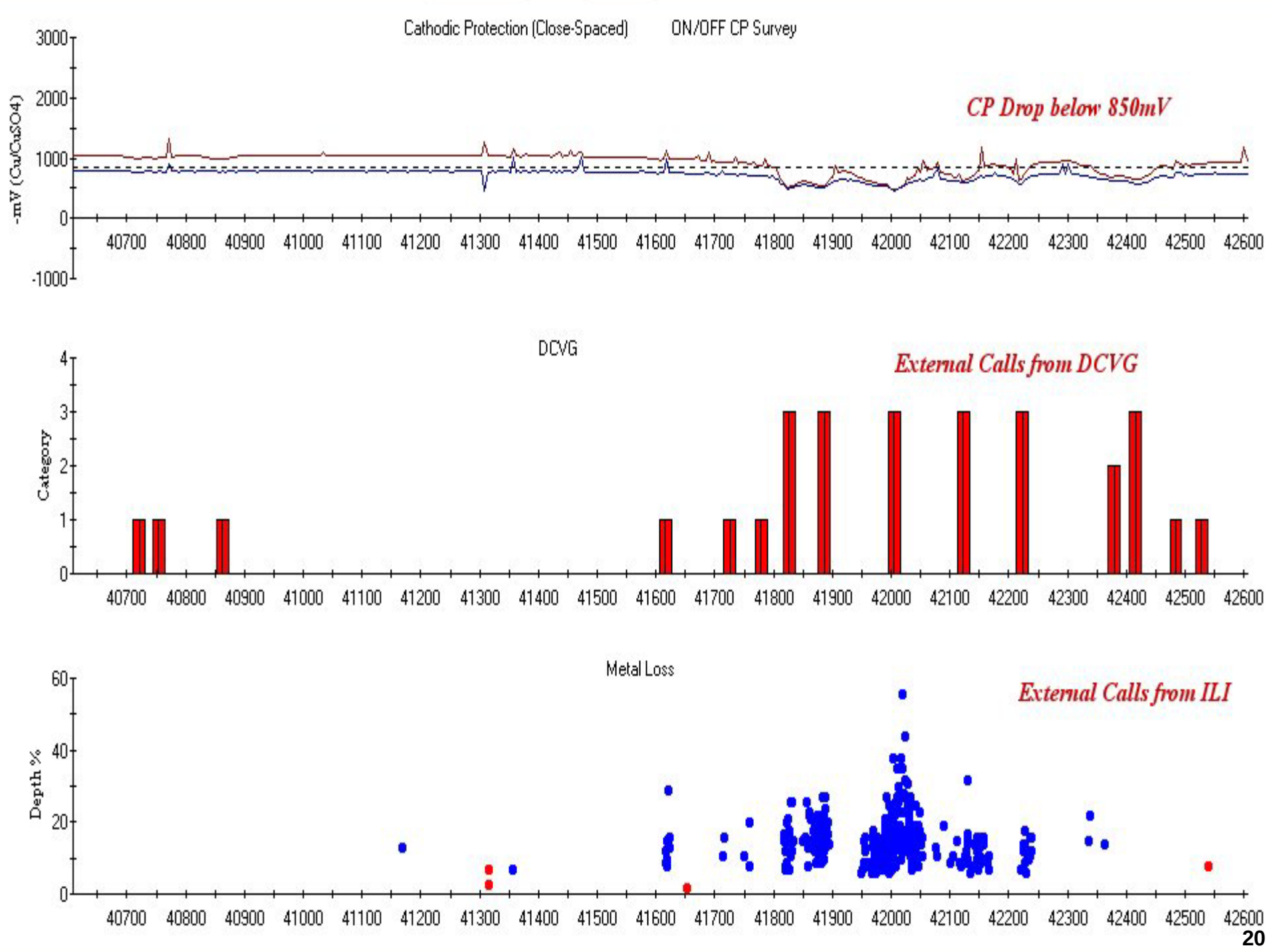
(ECDA Region Defined)

- ECDA Regions not necessarily contiguous
- Similar physical characteristics
- Similar operating and corrosion history
- Similar expected future corrosion conditions
- Same indirect examination methods apply
- Regions can be redefined if observed conditions indicate appropriateness

ECDA Region Indications



Severe indications	Moderate indications	Minor indications
Immediate action	Scheduled action	Monitored action
Excavate all indications	Excavate 2 high risk indications	Excavate one high risk indication


Cathodic Protection (Close-Spaced)
ON/OFF CP Survey
-mV (Cu/CuSO4)
3000
2000
1000
0
-1000
CP Drop below 850mV
40700 40800 40900 41000 41100 41200 41300 41400 41500 41600 41700 41800 41900 42000 42100 42200 42300 42400 42500 42600
DCVG
Category
4
3
2
1
0
External Calls from DCVG
40700 40800 40900 41000 41100 41200 41300 41400 41500 41600 41700 41800 41900 42000 42100 42200 42300 42400 42500 42600
Metal Loss
Depth %
60
40
20
0
External Calls from ILI
40700 40800 40900 41000 41100 41200 41300 41400 41500 41600 41700 41800 41900 42000 42100 42200 42300 42400 42500 42600

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Gas IMP - NPRM

(Confirmatory Direct Assessment)

- Confirmatory DA is a streamlined integrity assessment method that utilizes process steps similar to DA to evaluate for presence of corrosion and third party damage.
- If used, CDA Plan is required (ECDA example)

  Process similar to DA except:

  - Indirect examination by one tool
  - Excavation of all immediate action indications
  - Excavation of one indication in the scheduled action category
  - No excavation in the monitored indications
  - Remediation similar to DA

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Gas IMP - NPRM

(Baseline Assessment Intervals)

- Start date is December 17, 2002
  (Date of the new Pipeline Safety Law)

- Operators using ILI or pressure testing
  - Must complete Baseline within 10 yrs
  - 50% of covered pipe must be assessed within 5 Years (Focus on highest risk segments)
  - Exception: "Moderate Risk Areas" must be assessed within 13 Years

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Baseline Assessment Intervals (cont.)

- Operators using direct assessment
  - Must complete Baseline within 7 yrs
  - 50% of covered pipe must be assessed within 4 Yrs (Focus on highest risk segments)
  - Exception: "Moderate Risk Areas" must be assessed within 10 Years

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Baseline Assessment Intervals (Cont.)

- The use of prior assessments
  - Integrity assessments satisfying requirements of this rule conducted subsequent to 12/17/97 may be used as the baseline
  - The date of this earlier assessment is that when the reassessment interval begins

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Actions to address integrity issues:

- Immediate repair conditions, 180-day remediation, and longer than 180-day remediations per OPS and ASME B31.8S std.

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Gas IMP - NPRM

Preventive and Mitigative Measures

- Operators to consider additional actions specific to their systems to enhance public safety
- P & M measures include considering remote control valves or emergency shut-off valves, computerized monitoring and leak detection systems, extensive inspection and maintenance
- Reference ASME B31.8S std.

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(Reassessment Intervals)

- Reassessment period (for segment) begins upon completion of previous assessment

- If interval is longer than 7 years, operator must conduct “Confirmatory Direct Assessment” within 7 years

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Reassessment Intervals (cont.)

- Operators using ILI or pressure testing
  - Maximum interval of

    10 Yrs (Hoop stress ≥ 50% SMYS); or
    15 Yrs (Hoop stress < 50% SMYS)

- Operator using direct assessment
  - Maximum interval of

    5 Yrs (Sample Defect Excavated); or
    10 Yrs (All Defects Excavated)

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(Performance Measures)

Monitor Effectiveness :

- Measures needed to track actual performance & value of assessment & repair activities - Ref. ASME B31.8S std.
- Four overall performance measures accessible to OPS and State

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Gas IMP - NPRM

(Required 4 Performance Measures)

- Miles Assessed vs. Program Requirements
- Number of Immediate Repairs Completed
- Number of Scheduled Repairs Completed
- Number of Leaks, Failures, Incidents (by Cause)

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(Public Comments Invited)

- Should rural buildings (e.g. rural churches, etc.) be designated as MRAs requiring less frequent assessments or enhanced P&M?
- Should we allow max. 20 yr reassessment interval (w/ a CDA – 7th and 14th yr) for pipe operating below 30% SMYS? (applicable to press test or ILI methods)
- Should we allow reassessment every 7 yrs by CDA method only for pipe operating below 20% SMYS?
- Should we allow 10 yr reassessment interval (by DA method) for pipe operating less than 30% SMYS, if the operator excavates and remediates at least highest risk anomalies?
- Should OPS accept NACE std. for DA (external corrosion) without extensive requirements?

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Milestones

- **Final Rule - HCA definition … 08/06/02**
- **NPRM - Gas IMP…….. 01/28/03**
- **NPRM - Mapping ……... Spring 2003**
- **Final Rule – Gas IMP ……. 12/17/03**