

eliminate the possibility of fatality and ignition of protective wooden structures.

A large number of commenters were opposed to the use of a Threshold Radius, and asserted that its use is unjustified and with no technical basis. Northeast Gas Association commented that the wording is confusing and asked for clarification as to whether the Threshold Radius becomes 1,000 feet when the PIR exceeds 660 feet and when the diameter is also 36 inches and the pressure is 1,000 psig or greater. The Iowa Utilities Board concurred that the PIC and Threshold Radius should be based on the distance of the actual hazard and not on arbitrary distances that include areas outside of the Potential Impact Radius. The Iowa Utilities Board further contended that burdens on small pipelines and operators should be minimized. PECO asked for additional clarification as to whether the radius of all Class 3 and 4 locations is effectively 1,000 feet.

AGA and several operators, including Baltimore Gas and Electric, suggested that operators of pipelines operating below 30% SMYS should not be required to go beyond the actual impact zone calculations in their identification of HCA areas. Laclede Gas stated that there should be no margin above the C-FER calculation, especially for pipelines operating below 30% SMYS.

*Response:* The appropriateness of the C-FER model was the subject of considerable discussion at the public meetings held during the comment period on the proposed rule. As a result of these discussions and comments to the docket, RSPA/OPS has concluded that the C-FER model is sufficiently conservative for use in the screening process to identify HCAs. RSPA/OPS believes the model adequately reflects the distance, lateral to the pipeline, at which significant effects of accidents will occur. In the final rule, we have adopted the model as the basis for calculating Potential Impact Circles under the bifurcated option for defining HCAs (discussed in prior section) with the addition of the one radius at either end (discussed below).

Discussion at the public meetings and with the advisory committee, and analysis of recent pipeline accidents, also identified that pipeline accidents have sometimes affected an elliptical area, with the long axis of the ellipse along the pipeline. The NTSB noted that this likely results from horizontal jetting in the direction of the pipeline. The elliptical nature of the burn pattern means that the C-FER radius is not always conservative in identifying the maximum distance from a potential

pipe rupture, measured along the pipeline, at which the effects from the rupture will be felt. Following careful analysis of the burn patterns near pipeline ruptures, RSPA/OPS determined that it is appropriate to add an additional length of pipeline equal to the C-FER radius on either side of a high consequence area, *i.e.*, increase its extent along the pipeline, rather than increase the lateral distance. INGAA concurred with this approach. We have incorporated this approach into the final rule. Where Potential Impact Circle(s) are used to define HCAs, the pipeline segment in the high consequence area extends from the outermost edge of the first circle to the outermost edge of the last contiguous circle. This is illustrated in Appendix, Figure E.I.A to the final rule. Under the proposed rule, the segment would have been limited to the pipe between the centers of these circles.

The concept of Threshold Radius has been eliminated from the final rule. This concept was intended to apply some margin to C-FER calculations and to simplify the identification of HCAs. As described above, RSPA/OPS is convinced that the C-FER model is conservative enough for this purpose. We are also convinced by the comments that the use of Threshold Radius complicated, rather than simplified, the identification of HCAs. With the elimination of this approach, pipeline segments are included or not included on the basis of the calculated distance of the actual hazard, as recommended by many commenters.

RSPA/OPS has not adopted the suggestion that maximum operating pressure, instead of MAOP, be used in C-FER calculations. MAOP reflects the pressure at which the pipeline can be operated, and thus the hazard that could be experienced. This is an inherent conservatism in the C-FER model, and has likely contributed to the successful validation of the equation against accident experience.

The final rule specifies that nominal pipeline diameter is to be used in C-FER calculations. It also provides, as did the proposed rule, that a different constant factor must be used when making the calculation for gases other than natural gas, and refers to ASME/ANSI B31.8S for this determination. RSPA/OPS does not agree that further derivation of a unique equation for other gases is necessary.

#### *System Considerations*

Numerous operators, including Peoples Energy, Houston Pipeline and Puget Sound, asked for clarification on the need to do additional studies or

calculations if and when they deem their entire systems to be HCAs. They asserted there would be no need for the additional effort if all parts of their system were designated as HCAs and any additional effort would be a waste of company resources and time. Oleska and Associates shared this sentiment and recommended allowing operators to classify pipelines as being in an HCA without going through any analysis.

The Iowa Utilities Board commented that the rule should allow a pipeline operator to exclude its own facilities when determining if pipeline is in a high consequence area.

*Response:* RSPA/OPS agrees that further analysis to identify HCAs is not necessary if an operator elects to treat its entire system as a high consequence area. The final rule requires that identification of HCAs include documentation of the Potential Impact Radius "when utilized."

The high consequence area definition, as modified by this rule, focuses on identifying areas where large numbers of people could be at risk from a pipeline rupture. RSPA/OPS expects that pipeline operator facilities should be treated the same way as other facilities. The only operator facilities that could affect the determination are facilities in which more than 20 operator employees gather for the number of days appropriate to the type of gathering place (*i.e.*, at least 50 days per year if outdoors, 5 days per week in at least 10 weeks per year if indoor). The number of such facilities is expected to be small. Where they exist, however, RSPA/OPS believes it is appropriate to provide consideration of those gatherings in the same manner as for gatherings of non-operator personnel.

#### *Moderate Risk Areas (MRAs)*

The NPRM proposed to include Moderate Risk Areas, areas located within a Class 3 or 4 location but not within the Potential Impact Zone. These areas would require less frequent assessment or enhanced preventive and mitigative measures. In the preamble to the NPRM, RSPA/OPS requested comment on two issues related to these areas:

- Comments on designating rural buildings, such as rural churches, as Moderate Risk Areas instead of as High Consequence Areas (68 FR 4278, 4296).
- Comments and cost information on an option to not require an assessment of a segment located within a Moderate Risk Area, but, rather, to require enhanced preventive and mitigative measures on the segment (68 FR 4278, 4284). The premise was that if houses are mostly clustered in one area of a