# Potential Risk due to Power Plant Gas Pipeline Interconnection

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## *Potential Risk from Gas Pipeline Interconnection*

**Energy Commission is the lead agency for the licensing review of thermal power plants 50 MW or greater and all appurtenant facilities**

- CEC evaluates gas supply, including pipeline connecting to the natural gas main or transmission line
- CEC assesses risk and impacts to public health and safety up to the point of interconnection with the existing transmission pipeline system

## *Risk from Gas Pipeline Interconnection*

### Natural gas and transmission pipelines

- The CEC relies on existing regulatory frame work over the proposed natural gas interconnection and existing transmission pipelines
  - Governed by state and federal laws and regulations
  - 49 Code of Federal Regulations parts 190 through 193
  - California Public Utilities Commission General Order-112
  - Current LORS require quality arc welding techniques, certified welders and inspection of welds. Many failures of natural gas pipelines associated with poor quality welds or corrosion

## *Risk from Gas Pipeline Interconnection*

### Natural gas and transmission pipelines

- A major cause of pipeline failure is damage from excavation activities near pipelines. Codes require clear marking of the pipeline route
- Existing codes address seismic hazard in design criteria. Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail
- High consequence areas, land use zoning and encroachment dictate pipeline construction and operation requirements

## *Risk from Gas Pipeline Interconnection*

**Natural gas and transmission pipelines**

- Regulations are often changed as the result of an accident
- San Bruno incident, as well as other incidents, will be analyzed and regulations updated as needed
- Starting in 2002, the Integrity Management Program requires regularly scheduled inspections and design reviews, risk assessment and mitigation measures of any pipeline that traverses high consequence areas

## *Risk from Gas Pipeline Interconnection*

### Potential impacts and risk

- Off-site connecting pipelines are always evaluated
- Planned route, construction and operations are evaluated to ensure LORS compliance, and no significant danger to the public
- Special situations may require design modifications (e.g., route, burial depth, strength, valve placement vulnerability, etc.)

## *Risk from Gas Pipeline Interconnection*

### Potential impacts and risk

- Potential Impact Radius (PIR) of a pipeline means the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property
  - For example a worst case for a typical 36 inch diameter transmission pipeline operating at conservative 1,500 psi results in a PIR of about 960 feet from point of interconnection
- In assessing risk, the Energy Commission looks at the PIR and high consequence areas

*Risk from Gas Pipeline Interconnection*

## Effect of gas pressure cycling during routine operations on pipeline integrity

- Penetration of variable renewable generation likely to increase regional and local natural gas demand and pressure fluctuations
- Pipeline modeling study indicates that times to failure are much greater than pipeline lifetime; 170 – 400 years
- PHMSA records have no incident of a pressure-cycle induced fatigue failure of a hydro-tested gas transmission pipeline

## *Risk from Gas Pipeline Interconnection*

### Gas blows for initial pipeline cleanout

- US Chemical Safety Board: the practice of using flammable gas blows to clean debris from newly installed gas piping is an inherently unsafe practice and should be prohibited
- CEC condition of certification now prohibits flammable gas blows for pipe cleaning at the facility either during construction or after the start of operations
- Inherently safer methods using a non-flammable gas (e.g. compressed air or nitrogen, steam) or mechanical pigging must be used for initial cleaning of piping

## *Risk from Gas Pipeline Interconnection*

# References


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- “PHMSA Review of Transportation Related Damage and Fatigue Issues with Natural Gas Transmission Line Pipe”, U.S. Department of Transportation, July 6, 2009
- Letter from Cynthia Douglass, Acting Deputy Administrator, Pipeline and Hazardous Materials Safety Administration (PHMSA), to Hon. Deborah A.P. Hersman, Chairman, National Transportation Safety Board, August 10, 2009