SwRI®

SOUTHWEST RESEARCH INSTITUTE

Cased Pipeline Corrosion Model

Southwest Research Institute® (SwRI®) developed the CAsed Pipeline COrrosion Model (CAPCOM) to evaluate corrosion conditions of cased pipeline sections. The software enables SwRI engineers to evaluate the effectiveness of cathodic protection (CP) systems under the complex geometrical, electrical, and environmental conditions associated with cased pipeline segments at crossings such as highways, railroads, and rivers. The software also can be used to evaluate corrosion when there is electrolytic or electrolytic-plus-metallic contact between the casing and the carrier pipe.

These assessments are vitally important for evaluating the thousands of cased crossings located worldwide, to improve understanding of:

- Pipe-to-soil potentials along the cased pipeline
- Degree of CP current diversion to the casing pipe
- Level of cathodic protection at the carrier pipe

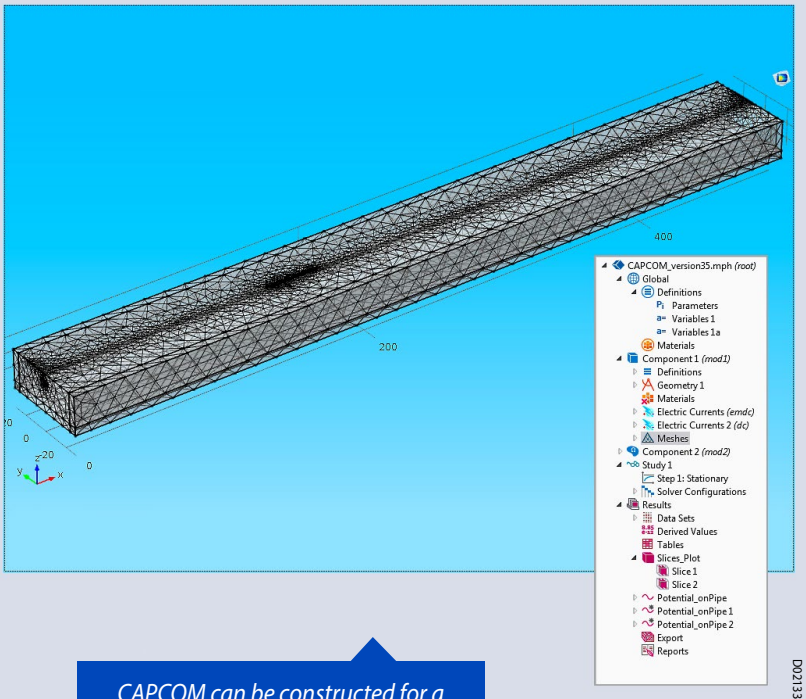
CAPCOM Capabilities

SwRI developed this software to evaluate corrosion conditions and determine the ability of a CP system to mitigate corrosion of the cased-pipeline segment. CAPCOM is capable of modeling a wide range of conditions, and has the ability to:

- Identify corrosion conditions and CP level of the cased- and uncased-pipeline segments when there is electrolyte between the carrier and casing.
- Quantify the effectiveness of an in-service CP system installed to mitigate corrosion of the cased- and uncased-pipeline segments when there is electrolytic-plus-metallic contact between the carrier and casing, and to estimate diversion of CP current to the bare casing.
- Quantify any additional CP current needed to protect the pipeline and meet the CP criteria in case of electrolytic-plus-metallic contact between the carrier and the pipeline.

When sufficient data are available, the model can be fed with the significant number of inputs required to simulate corrosion conditions of the cased pipeline, and to determine whether CP can protect the casing pipe when there is electrolytic or electrolytic-plus-metallic contact between the casing and the carrier pipe.

When parameter values are not available, nominal values can be selected and a range of variability explored. For this application mode, CAPCOM will provide an expected range of corrosion conditions, as well as the electrode potential of the pipeline casing.



CAPCOM can be constructed for a specific set of geometric parameters and field conditions. The constructed model can be visualized using the graphical user interface.

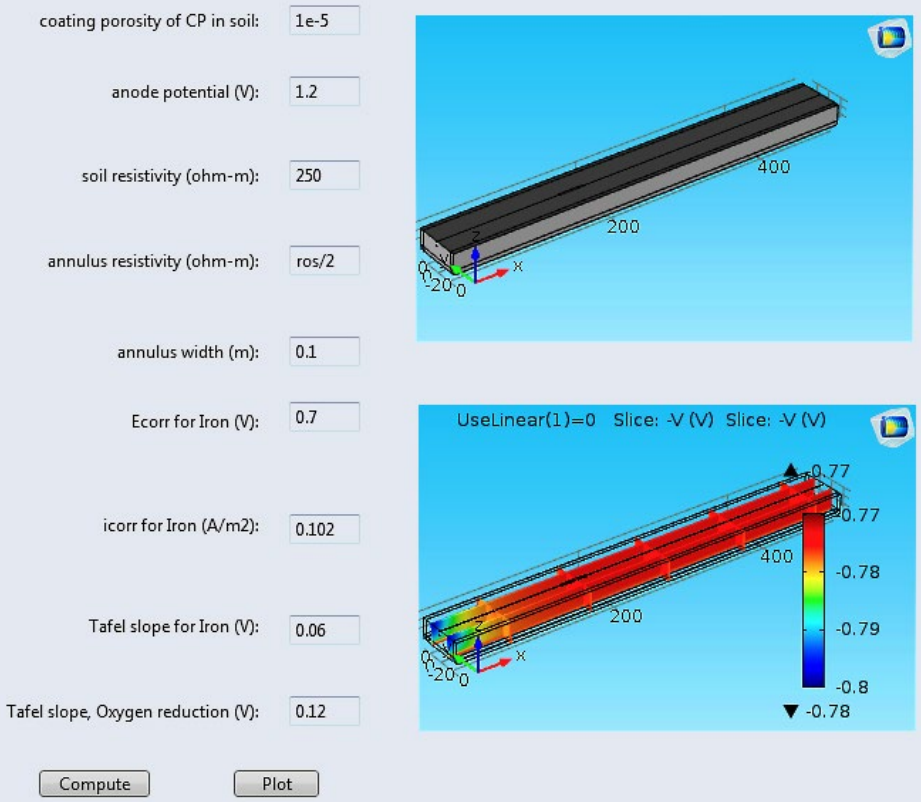
CAPCOM Functionalities

Geometry and soil conditions at the cased pipeline sections vary from site-to-site and operator-to-operator. CAPCOM can be easily constructed for a specific set of field conditions, and then executed for various scenarios. To provide an environment for effective interpretation, the software offers a variety of interactive tools, including:

- User interface for input parameters including parameter ranges
- Display of structure-to-soil electrical potential color maps along the carrier pipe, including inside the casing
- CP current distribution along the carrier pipe

Services Available

SwRI engineers can work with you to define and solve your complex pipeline corrosion problems. Alternatively, we can build an executable model tailored to a set of problems you are encountering, and provide it to you for use.



CAPCOM stand-alone applications for specified field conditions include a graphical user interface for input parameters and model results.

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We welcome your inquiries. For more information, please contact:

Yi-Ming Pan, Ph.D.
Staff Engineer
210.522.6640
yi-mingpan@swri.org

Center for Nuclear Waste Regulatory Analyses
Chemistry and Chemical Engineering Division

CAPCOM.swri.org

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