



NEP USES MOSES MODEL TO TEST SUBSTATION SPILL CONTAINMENT STRUCTURES

"The MOSES model and EPRI support were a great help to us in preparing our SPCC plans."

■ **Robert DeHart**
New England Power Company

BENEFITS

- EPRI's mineral oil spill evaluation system (MOSES) allowed New England Power Company (NEP) to quickly and efficiently evaluate the capability of spill containment structures at its substations.
- Using MOSES, NEP determined that secondary containment structures were not needed at 16 of these substations, saving the utility \$816,000 in construction costs.

Challenge

The electric utility industry has more than 48,000 substations that may be subject to the Spill Prevention, Countermeasures, and Controls (SPCC) regulations. These regulations require nontransportation-related facilities to prepare SPCC plans that meet certain location and storage volume criteria and that may discharge harmful quantities of oil to surface water or adjacent shorelines. The regulations address appropriate containment structure and

spill response contingency procedures to prevent the discharge of oil to surface water. NEP has 384 substation locations that may require SPCC plans. A preliminary screening of these locations identified 188 where additional secondary containment structures would be recommended, and 39 that required further evaluation. Without a test to conclusively demonstrate the effectiveness of contingency procedures versus containment, secondary containment structures would have been recommended at all 39 locations in the last category.

Response

NEP applied EPRI's MOSES model to the 39 locations to carry out further evaluation. The user-friendliness of MOSES allowed NEP to do the evaluations in-house. Data pertaining to infiltration, on-site storage, volatilization, soil and vegetation, off-site retention, overland flow, and rainfall were input to the model, which then utilized a Monte Carlo technique to estimate the probability that a spill would occur and reach surface waters. Since the model was initially developed to assess the industrywide likelihood of release, EPRI worked closely with NEP to ensure that the model met their specific needs. The model was enhanced to enable NEP to evaluate the spill potential for each piece of equipment rather than for the aggregate from several pieces of equipment. The results of the MOSES modeling indicated that the existing primary containment structures at 16

Response

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of the 39 locations were adequate, while secondary containment structures would be necessary at the remaining 23 substations.

EPRI Perspective

The MOSES model was developed by EPRI in response to proposed SPCC regulations. MOSES was designed to evaluate the probable number of facilities, industrywide, that might have releases that reach adjoining surface

waters. Utilities are now using MOSES as a decision support tool to evaluate the potential for oil releases to migrate from their individual substation equipment for aboveground tanks to nearby surface waters.

Calculated Value of New England Power Company's Application

Estimated Saving (\$000)

	Investment Saving	Fixed Charges ⁽¹⁾	O&M	Total ⁽³⁾
Construction of Containment Structures ⁽²⁾	384		432	816

Basis for Benefits

1. This application involves no fixed charges.
2. The MOSES evaluation identified 16 sites that did not require secondary containment structures. Construction saving is based on an average cost of \$51,000 for secondary containment structures (\$24,000 Investment and \$27,000 O&M).
3. Calculated saving does not include saving associated with the in-house application of MOSES.

- If MOSES had not been available, field assessments would have been required at the 39 sites. NEP estimates that consulting fees would have been about \$10,000 per site. Therefore, saving attributed to using MOSES in-house is about \$390,000.
- All costs are expressed in 1992 dollars.

References

- *MOSES Code Version 1.0: An IBM PC Code for Predicting the Transport and Fate of Mineral Oil Spills*. Interim Report, EPRI EN-7188, April 1991.
- Murarka, I. "MOSES: Mineral Oil Spill Evaluation System." *EPRI Journal*, July/August 1991, pp. 46-48.

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Interest Categories

- Land and water quality—ecosystem response
- Waste & water management
- Risk analysis; management & assessment
- Computer software
- Distribution substations

