RF Heating for Heavy Oil and Bitumen

Acceleware’s combined expertise in electromagnetics (EM) and oil and gas uniquely positions the company as a leading provider of technology and consulting services for the use of radio-frequency (RF) energy to heat oil reservoirs in situ. RF heating is an emerging technology with the potential to provide an efficient production solution that competes favourably with, or enhances traditional steam heating and solvent based techniques used for producing heavy oil.

RF heating is achieved by placing an antenna into a well to radiate energy into the formations, lowering the viscosity of oil and allowing for production. This method can provide an economic production solution for both oil sands and carbonate formations, as well as stranded reserves where steam floods or solvent methods alone are ineffective or unavailable.

Simulation Software
AxHEAT, Acceleware’s RF heating application, integrates reservoir simulation with EM simulation to accurately model the heating process within a reservoir. The application tracks both the petrophysical and electromagnetic properties of reservoir, as they evolve over time, dynamically adjusting antenna radiating field and heating patterns, fluid temperatures, pressures, and viscosities in response to electromagnetic radiation and heating.

Professional Services
Acceleware provides a range of engineering services to accurately model the RF heating process within a reservoir. Services include antenna design, system design, comparative studies, modelling, and real time monitoring. RF heating solutions can be customized to meet the needs of a wide range of reservoir formations and well geometries - whether shallow or deep, vertical or horizontal.
AxHEAT Application

- Accurately models RF heating within a reservoir
- Integrates reservoir and electromagnetic simulators
- Tracks petrophysical and electromagnetic properties
- Dynamically adjusts the antenna fields and reservoir properties

AxHEAT Simulation Application

Reservoir Model Input
Import your reservoir model, or choose a conventional model

RF System Input
Select from standard antennas, or import a custom design

AxHeat
The electromagnetic properties of the formation are calculated

Reservoir simulator computes temperature, pressure and water saturation of the formation

Electromagnetic simulator computes electromagnetic field and specific absorption rate

The heat source is calculated

Simulation Results
- Energy input
- Fluids production
- Heat and temperature distribution in reservoir
- Other process parameters (pressure, viscosity, saturations, etc.)
- RF parameters (e.g. impedance) variation in time

Learn More About AxHEAT™
Contact us today to discuss the benefits and applications of AxHEAT.
+1.403.249.9099
sales@acceleware.com
acceleware.com/rf-heating