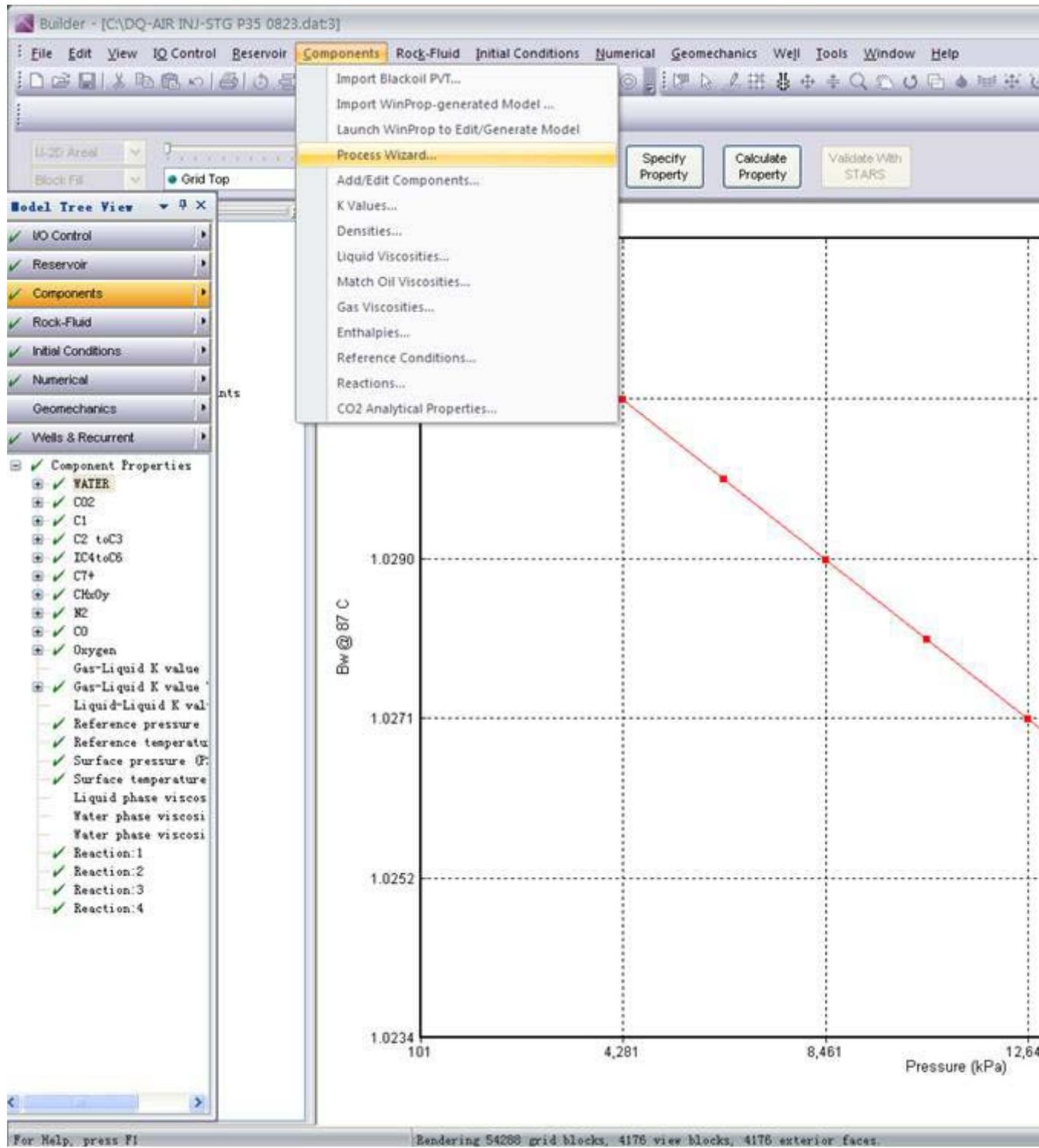


Builder-Process Wizard（过程向导）功能 在提高采收率模拟中的应用

CMG-STARS 软件用于热采、化学驱以及很多提高采收率方式模拟，而有些过程用户不太熟悉或缺乏实验资料，有时觉得无从下手。目前版本下，利用 CMG-Builder 中的 Process Wizard(过程向导)，用户可以方便、快速地实现注空气、三元复合驱（含一元及二元）、泡沫油、微粒运移等多种 EOR 方法的流体建模。

CMG 致力于将用户从繁重的数据处理中解放出来，把宝贵的时间和精力用于数据分析和方案设计上。CMG 目标是在未来版本中把所有提高采收率过程的模拟实现 Builder 流体建模。下面以注空气模型为例，操作步骤介绍如下：

第一步：打开 Builder，进入 Components->Process Wizard



第二步：选择燃烧模型-Combustion Model

Builder - [C:\DQ-AIR INJ-STG P35 0823.dat3]

File Edit View IO Control Reservoir Components Rock-Fluid Initial Conditions Numerical Geomechanics Well Tools Window Help

2D Areal Plane 1 of 13 Grid Top 2006-01-01 Specify Property Calculate Property Validate With STARS

Model Tree View

- ✓ IO Control
- ✓ Reservoir
- ✓ Components
- ✓ Rock-Fluid
- ✓ Initial Conditions
- ✓ Numerical
- Geomechanics
- Wells & Recurrent

Component Properties

- ✓ WATER
- ✓ CO2
- ✓ C1
- ✓ C2 to C3
- ✓ IC4toC6
- ✓ C7+
- ✓ CH₂O_y
- ✓ N₂
- ✓ CO
- ✓ Oxygen
- Gas-Liquid K value
- Gas-Liquid K value
- Liquid-Liquid K value
- Reference pressure
- Reference temperature
- Surface pressure (Pa)
- Surface temperature
- Liquid phase viscosity
- Water phase viscosity
- Water phase viscosity
- Reaction:1
- Reaction:2
- Reaction:3
- Reaction:4

Process Wizard Step 1 - Choose Process

This wizard will use the existing fluid model section for STARS and add the necessary data for the process desired to be simulated. The user must begin this wizard with a minimum of two or three components that describe the black oil behavior of the system.

Choose a process from the combo box below and a description will be displayed.

Combustion model

This option implements combustion models for either light oils, or heavy oils. There is an important distinction between the cases of air injection applied to light-oil reservoirs and in-situ combustion. In both cases, various oxidation reaction schemes exist. However, air is used in the first case to improve the recovery factor by flue gas sweeping; in heavy-oil reservoirs, thermal effects are used to reduce the oil viscosity and mobilize the oil. It is worth noting that higher oxidation temperatures can be reached with heavy oils - about 800 vs. 400 °C for light oils. This temperature difference comes from the nature of the fuel, more fuel of higher density is burnt in heavy-oil reservoirs. Hence, in the literature, the oxidation of light oils is mainly related to reactions in the low-temperature range (LTR), while heavy oils are burnt according to low temperature-oxidation reactions or high temperature-oxidation reactions. The LTR reactions correspond to partial oxidation or simply oxidation reactions when only stable polar compounds are formed by oxygen addition without carbon oxides release, and combustion or complete oxidation when these oxygenated compounds are destroyed to form carbon monoxide and dioxide.

< Back Next > Cancel

Bw @ 87 C

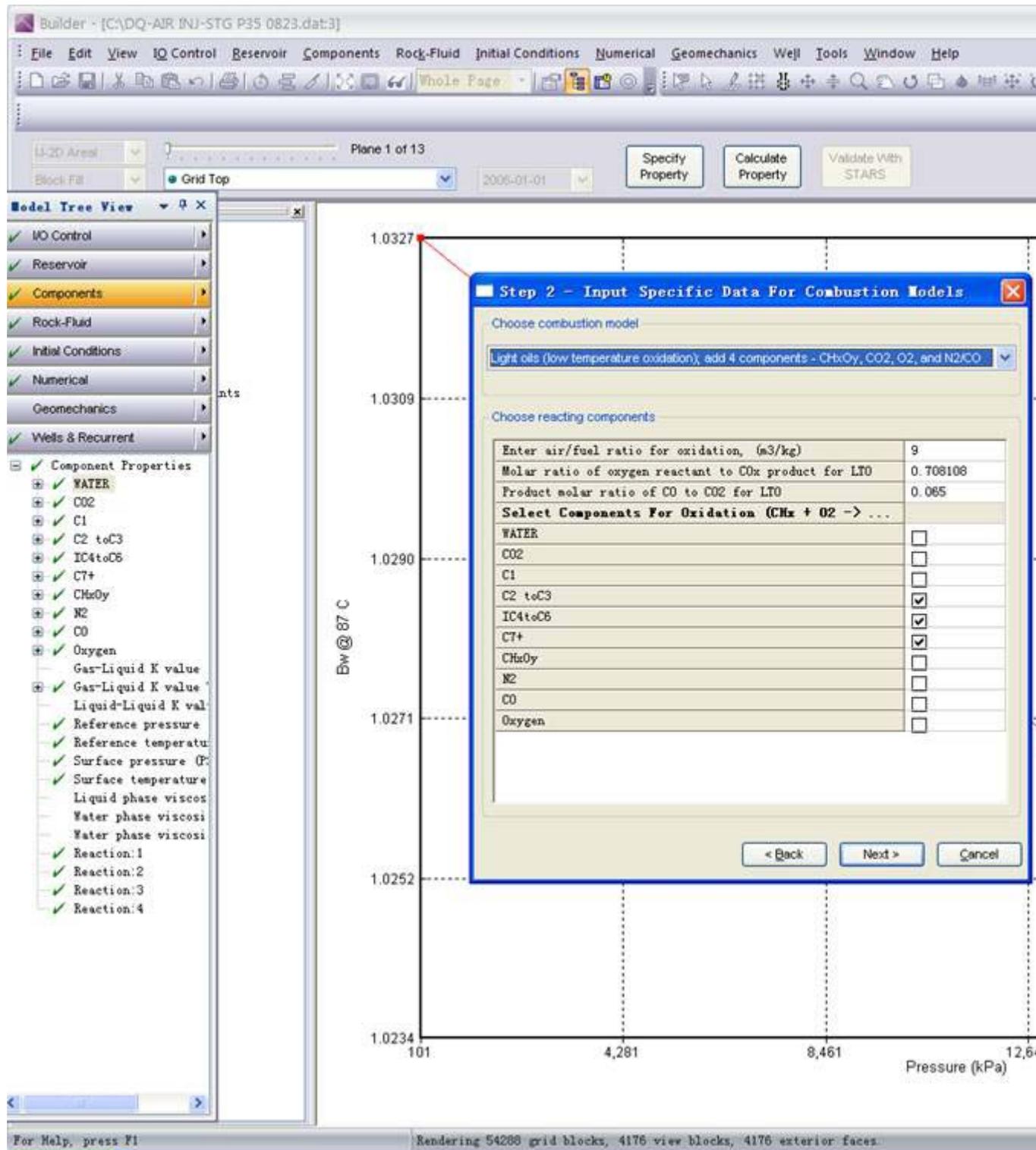
Pressure (kPa)

101 4,281 8,461 12,600

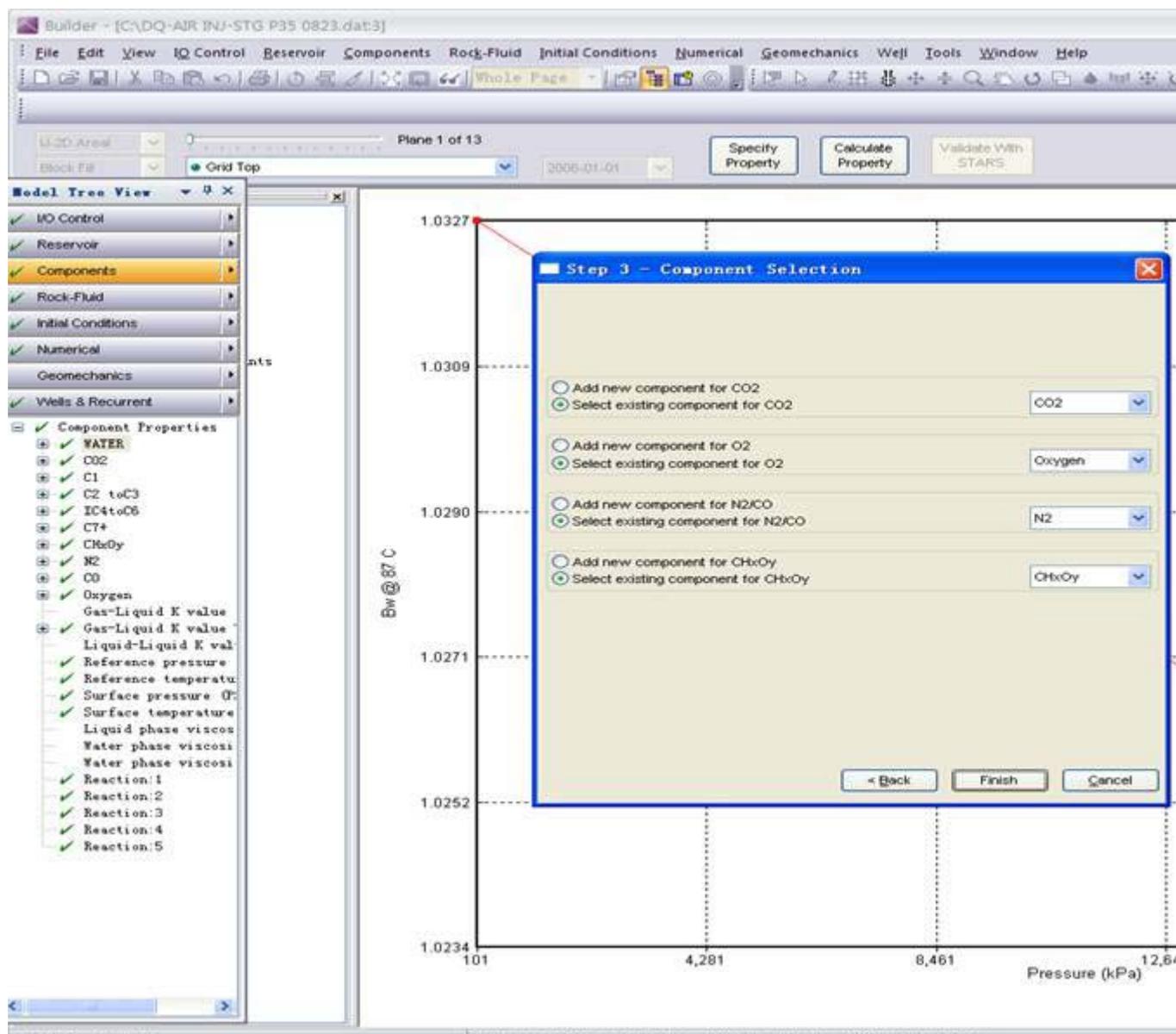
1.0234 1.0252 1.0271 1.0290 1.0309 1.0327

For Help, press F1 Rendering 54288 grid blocks, 4176 view blocks, 4176 exterior faces.

第三步: 选择 Light Oil 模型, 并选择相应的参数, 例如空气燃料比、氧气与生成的碳氧化物比, 选择燃烧的组分等。



第四步：如果原组分定义中没有生成物，向导会自动生成生成物如 CO₂，CH₂O₂ 等。选择完成就可以建立一个注空气模型了。



如果想实现一次反应，如油反应生成烃氧化合物，则只需要把后面的裂变燃烧反应删除就可以了。

这样，原来非常复杂的注空气火烧油层模型，在 Builder 的帮助下，你可以 10 分钟内建立一个参数设置较为合适的模型了。用户可以尝试建立其它模型，例如三元复合驱等。